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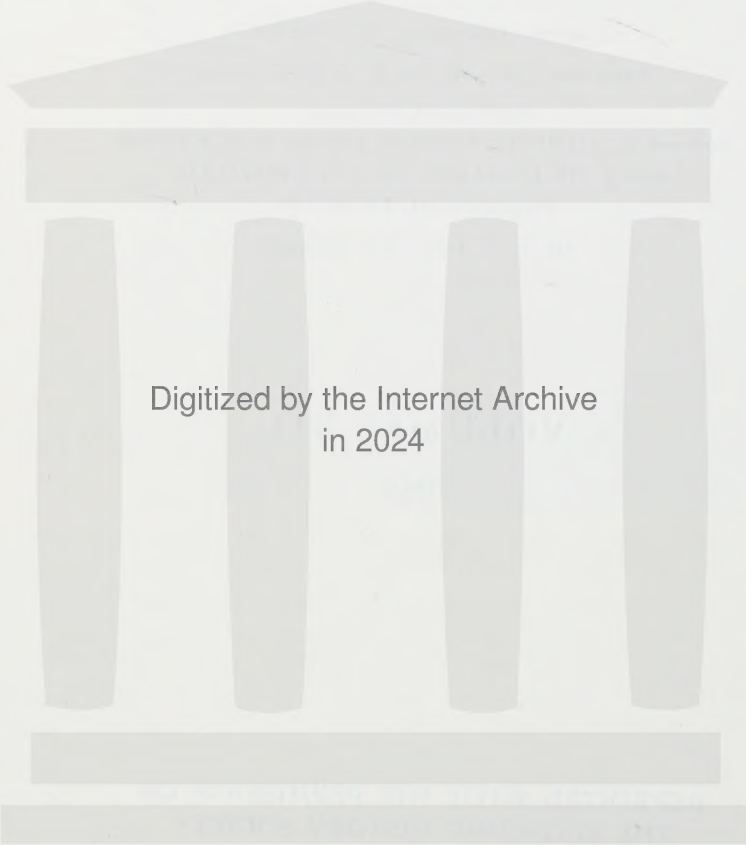
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SOME SOCIAL CONSEQUENCES OF THE HUNDRED YEARS' WAR

By M. M. POSTAN

I

THE Hundred Years' War shares with the Reformation and the French Revolution the reputation of being a 'turning point' or a 'watershed'. It is commonly referred to as the culminating episode of the Middle Ages, marking the final failure of the feudal armies. Having destroyed the feudal order, the War also reared its successor. It is now generally accepted, even by Bernard Shaw, that out of the clash between the French and the English kings the national state and the nationalist conception of international policy emerged triumphant.

It is not our object here to quarrel with this generalization. As long as it is general enough and confined to notions as vague as those of the feudal order and the national state, it is both difficult and unnecessary to disprove. There is no denying that the hundred and fifty years which separated the beginning of the War from the final pacification of Western Europe under Louis XI were marked by many signs of popular nationalism. During the same period in one country at least, namely France, national monarchy and national unity were greatly strengthened. On the other hand, in countries other than France or Britain, national sentiment was no more in evidence in the fourteenth and fifteenth centuries than it had been in earlier times. Where it operated, in the Hussite War and at Tannenberg, it owed little or nothing to the issues which roused similar feelings at Crécy and Orléans. As for the national state, England of the twelfth and thirteenth centuries had nothing to learn from England of the fifteenth. If anything, the closing stages of the war, coinciding as they did with the civil war at home, stimulated centrifugal forces of every type and kind, and threatened to re-establish in England a feudal régime on the ruins of the Lancaster monarchy.

The generalization, so difficult to prove or to disprove, had better be left alone. Our object here is to probe into the effects of the War at a level at which they are, by definition, more concrete, and therefore more

amenable to proof. The War, like all historical events, must have had immediate and apparent effects on economic life and social relations. According to some sociologists, notably Sombart, it is in the nature of war to revolutionize economic processes. This view has been tacitly endorsed by the host of writers, publicists, historians and sociologists, who have taken it for granted that since the last great war the economic life of nations has never been the same, and that the present war is also bound to transform the entire economy of the world. Our object here is to find out whether this view also holds good of the Hundred Years' War.

II

The historian in search of tangible effects of the Hundred Years' War will probably discover that the effects become less tangible as he penetrates the foundations of society. They are easiest of all to discover in the field in which they are probably most superficial, namely in the economic repercussions of the final territorial settlements.

In the second half of the fifteenth century the French kings extended their rule to all, or nearly all, the provinces which from then onwards have constituted the national territory of France, as we now know it. The economic and social consequences of this process have been much discussed but frequently misunderstood. Contrary to the common view, the territorial rearrangements in Western Europe were of more immediate economic consequence to England than they were to France. French territorial unity was not followed by an immediate economic and social merger. The re-establishment of French rule over Picardy and Normandy did little to establish closer economic and social links between those provinces and the rest of France than heretofore. The granaries of the lower Seine gave Paris and Île de France added security against famine, but in any case Île de France had not been greatly dependent on imported food, and the natural outlet of the vast grain surpluses of Abbéville continued to be not France but the Netherlands. Brittany remained what it had always been: a maritime province with an economic and social life intensely local and all its own. The time when the Bretons were to lead in the expansion of France overseas was at least a century off. Even Aquitaine, for all the spectacular part which, in subsequent French history, fell to the Gascons and to the Gasconade, was as yet alien to the economy and society of France as a whole. Generally speaking, France, for several centuries after the Hundred Years' War, continued to function as a loose confederation of provinces, separated by customs barriers, local weights, measures and laws. It was not until the French Revolution that legal and administrative barriers to national unity were removed, and it was not until the coming of the railway that that unity was in fact established.

The effects on England, though less advertised, were much more immediate. For a time, England lost more than France gained. From a narrowly economic point of view, the Angevin empire was much less artificial than many empires before or since. Aquitaine and England were bound by economic links which, on the eve of the loss, were both old and

strong. The two economies were mutually supplementary. Gascony produced little grain, had next to no wool or cloth, and specialized in the production of wine, certain technical crops (mostly dye-stuffs) and iron. On the other hand England was an unquenchable consumer of wines, a good customer for Gascon woad and Bayonne iron, and above all the principal supplier of cloth and food. England continued to export grain to Bordeaux long after she ceased to export it to other countries, and on several occasions in the late fourteenth and the fifteenth centuries, when she had no grain of her own to send, she re-exported cereals of Baltic origin. Next to Germany, Aquitaine was England's principal market for finished cloth and, to some extent, for other industrial products.

This symbiosis was, for a time, severed by the loss of Aquitaine. England's loss of claret was neither tragic nor permanent. 'Thirst will find a way', and new ways, though expensive and restricted ones, were soon found, and by 1480 English merchants were again active in Bordeaux. But relatively brief as it was—a matter of some twenty-five years—the interruption was acutely felt and left an indelible mark. The markets of Gascony were lost at the time when other markets were also disappearing, and when outlets for the English cloth production were being steadily contracted. Students of English economic history will recall that by the middle of the fifteenth century the English cloth merchants had been excluded from all their more distant outposts. The Scandinavian market had been lost at the turn of the century. Connexions with Prussia, and, through that country, with the whole of central and eastern Europe were finally lopped off by the successive Anglo-Hanseatic conflicts in the thirties and fifties. The concentration of English trade in the Netherlands, the specialization of English industry on unfinished cloth, the rise of the company and of the monopoly of the Merchant Adventurers—all these familiar features of English trade at the close of the Middle Ages could be traced to the break-up of England's medieval empire at the end of the Hundred Years' War.¹

The territorial constriction of England's foreign trade had some obvious social repercussions. The expansive and speculative spirit which had dominated the activities of England's mercantile classes in the fourteenth century was bound to be damped by the loss of markets and opportunities, to say nothing of the loss of goods and cargoes in foreign lands. By the middle of the following century the narrowing horizons brought to the surface a new type of merchant and a new type of mercantile organization: sober, modest and disinclined to act alone. One of the paradoxes of English commercial history is that the merchants ceased to adventure at the very moment at which they arrogated to themselves the title of adventurer. Corporate monopoly, rigid definition of terms of trade, restriction of the volume of trade, were designed both to keep out the outsiders and to prevent a disproportionate aggrandisement of individual

¹ Cf. E. M. Carus-Wilson, *The Overseas Trade of Bristol, etc.* (Power & Postan, *English Trade in the Fifteenth Century*, 1933.) M. Postan, *Economic Relations between England and the Hanse* (*ibid.*).

'insiders'. Its effect was to secure the position of men of mediocre substance trading in a 'middle way'.

The effects of the changes in foreign trade were greatly enhanced by their domestic setting. They coincided and combined with similar changes in the structure of English industry and commerce at home, which had, strictly speaking, little to do either with the Hundred Years' War or with foreign trade. It is now well understood that in the late fourteenth and in the fifteenth centuries the expansion of England's urban civilization was at an end. Not only were most of her ancient ports and corporate towns dwindling in size and population, but her town economy as a whole was congealed by the régime of corporate monopolies. Much of what has come to be regarded as evidence of the regulated and corporate spirit of medieval economy belongs not so much to the Middle Ages as to that phase of lost horizons which marks the English commerce of the late fourteenth and fifteenth centuries. The monopolies, the regulations, the rigid control of individual enterprise and the barriers to the entry of outsiders, and most of the other measures of restriction, were produced, rather suddenly, and rather recently, in response to the declining trade and falling prosperity.¹

The changes in urban life were merely part of the general transformation of English society, and were in their turn due to the decline of population and to the contemporary reorganization of agriculture. The break in English commercial expansion abroad and the fall of England's medieval empire merely contributed their quota to the general movement of retrenchment. But for that general movement, the contribution of the War would probably have been less effective, even though it might then have stood out clearer in our documents and books.

III

The difficulty of defining the effects of the War grows as we recede from the political and territorial consequences of English defeat into the economic and social processes of the War itself. Important social changes were bound to follow from a war effort extending over a century and a half. But the very fact that a chronic state of war continued for so long makes it very difficult to distinguish the action of war from the action of mere time. For it is only too easy to ascribe to the War what is, in fact, due to the hundred years.

A field in which the facts are easiest to distinguish is that in which national economy touched closest on the conduct of the War, i.e. war finance. Here certain causes and effects are so obvious as to require little proof. There has, undoubtedly, been much direct wastage of national wealth. With the outbreak of the War, Edward III's budgets probably rose three or fourfold, i.e. from somewhere between £40,000 and £70,000 in the first ten years of the fourteenth century to the average of about £200,000 in the twenties and the thirties. Much, though by no means most, of the wealth thus raised was sent abroad and wasted there to pay for alliances and to maintain garrisons and armies. As we shall see further, during the same period, national production and national income were not rising, but

¹ M. Postan, 'The Fifteenth Century', *Econ. Hist. Rev.* 1939.

if anything falling, and this meant that the destruction of wealth by the War remained uncompensated and that England was getting poorer.

Some of the impoverishment, and even some of the decline in national production, could be traced directly to war finance. Edward's taxation and, even more, his levies in kind led to a drastic decline of wool production. If we are to judge from the flood of complaints against purveyors, it appears that the requisition of foodstuffs in the countryside extended the depressing effects of war economy to agricultural production as a whole. It is also possible, though it still remains to be proved, that royal taxation, and still more royal seizures and confiscations, had something to do with the unmistakable decline of investment in agricultural improvements in dykes, drainage, and deforestation.

The main effects of war taxation, however, like the main effects of all taxation, would be found not in wealth destroyed but in wealth transferred. The signs of the transference were many and various, and at the very beginning of the War it looked as if the War would succeed in so redistributing the wealth of the country as to produce a major economic and social revolution. The readers of Miss Power's book on the wool trade will recall that the opening phases of the Hundred Years' War saw the sudden emergence in English life of a small group of financial and commercial magnates. They were called into being by the King's need of loans and of assistance in handling the new taxation on wool and the great imposts in kind. Through their hands passed most of the money which Edward raised between 1322 and 1350: a sum not less than two million pounds and probably more. Edward's bankruptcy, which nearly ruined the Italian bankers, left the English financiers for a short time in sole possession of the field. But sooner or later their turn to be ruined came, and they disappeared from the English scene even quicker than they rose. Their function was taken over by the corporate body of the Staplers who shared out among a larger body of substantial men the monopoly of the English wool trade and the function of state banking.¹

The establishment of the Staple helped to consolidate the middle-middle class, but it also nipped in the bud the first seedlings of England's 'high capitalism'. For a short time it had looked as if the War might raise in England the same class of financial capitalists which played so important a part in the genesis of early capitalism in the more advanced parts of Europe: the great commercial magnates of the Italian, South German and Provençal cities, the financiers of Arras in the thirteenth century, the Bardi and Peruzzi of the fourteenth, the Medici of the fifteenth, the Fuggers and Welsers of the seventeenth, the English nabobs and city bankers of the late seventeenth and eighteenth. National wealth was set moving out of the hands of the landed interests into those of men who might employ it in trade or commercial finance, or even in large-scale industry. In short, it seemed as if the social and financial prerequisites of an economic revolution, such as those which, in this country, appeared in the late seventeenth and in the eighteenth centuries, were being created in the fourteenth.

These hopes and dangers failed to come true. Not only were the great

¹ Eileen Power, *The Wool Trade in English Medieval History* (Oxford, 1941), *passim*.

financiers in the end replaced by men of more modest substance, but what is more, neither the magnates nor their 'middling' successors were as yet ready to finance an economic revolution. In fact, the so-called transference of wealth was more apparent than real, for most of the wealth thus transferred did not stay in its new surroundings for long. As we have already seen, some of it was destroyed and wasted abroad. But even that part which was not pumped across the Channel failed to create great pools of urban wealth or to irrigate the fields of English industry and trade. Most of it, as a rule, went back to the land.

The repatriation of rural wealth proceeded by two channels. One of the channels had little or nothing to do with the War, but was an ancient current of English history. No student of English medieval society will fail to observe what modern sociologists would probably describe as its 'social mobility'. Not only were divisions between classes—between merchant and knight, serf and freeholder, freeholder and knight, knight and noble—so vague as to be indiscernible, but they were also crossed and re-crossed, both up and down. It is now generally known that the upper ranks of the merchant classes were frequently recruited from land-owning families. It is also known that successful merchants could, in their own urban societies, acquire the status of 'miles' or 'armiger'. But the process of social rise was not confined to elevation within urban society, for it usually ended in migration from the towns to the country. The Middle Ages were well familiar with the process so characteristic of the last two centuries, by which wealth amassed in industry and trade was, in the end, devoted to the acquisition of stately homes and of their social appurtenances. The ambition of the wealthy Londoner has always been to become a gentleman. It is very instructive to watch the stages by which the interests of the Cely family shifted from Mark Lane to their place in Essex. It is there that, in the end, we find the younger branches of the family all but merged into the county society, and all but absorbed in the pleasures of the hunt. It may be true that some city families took no more than three generations to pass from shirt sleeves to shirt sleeves, but it is equally true that some took no longer to pass from country house to country house. The true exception to the rule was not the family which succeeded in maintaining itself in wealth for more than seventy-five years, but the family which, having kept its wealth, was content to enjoy it in Town.¹

The attractions of the countryside and of the social prizes of rural society will account for many otherwise inexplicable gaps in the family histories of the fifteenth-century towns. Many, if not most, of the names of the great merchants who are known to have been enriched by the war expenditure of the twenties and thirties, sooner or later disappeared from the records of English towns, and even from those of English trade. Some of their bearers died out, others, we know, were irreparably ruined by subsequent royal depredations. But some of the best known war financiers,

¹ The histories of the principal London families in the fourteenth and fifteenth centuries have been investigated in much detail by Miss Sylvia Thrupp, some of whose, yet unpublished, conclusions have been available to the writer.

men like the De la Poles, the Poultneys, the Pickards, not only left an offspring, but also salvaged substantial portions of their war fortunes, and sooner or later established themselves in the country and founded there gentle and even noble families.¹

This migration had an obvious effect on the economic processes of the Hundred Years' War. Such success as royal taxation may have achieved in squeezing the landed interests and in enriching the financiers was largely nullified by the latter's investment in land. The fact that some merchants got rich quicker than they might have done in peace time meant merely that they themselves or their offspring were enabled to leave the towns sooner. As a result of the War, the interval between the De la Poles who financed the War and the De la Poles who dominated rural society in the eastern counties was cut down to one generation, instead of the conventional three. Social mobility may thereby have been quickened, but the wheels of commerce showed no signs of revolving faster.

Another and even more important channel of repatriation was provided by the gentlemen of the sword and of the cloth. These men were probably the chief beneficiaries of the War, but conspicuous as they are in contemporary documents, they have been curiously neglected by historians. In spite of the central position which the army occupied in medieval life and of the voluminous records which its activities left in various royal offices, its administration and its social composition have, until recently, been little studied. Until more is known about the men who made up and ran the British expeditions abroad, all discussion of the subject is bound to be highly speculative and hypothetical.² But of all the hypotheses which the sources suggest, none is more fruitful and, therefore, worth exploring than that which stresses the rise and the importance of the soldier of fortune.

'The soldier of handsome fortune' would be a better and a more exact appellation of the type. It is now generally assumed that the organization and the composition of the army underwent an important change after the opening campaigns of the War. The national and feudal armies, which were raised by the mobilization of feudal levies and by Commissions of Array, and fought, or were supposed to have fought, on the fields of Crécy and Poitiers were, in the middle and the later stages of the War, largely superseded by units raised and maintained by professional military contractors. In the Hundred Years' War, as in so many other English wars, it was the amateurs who were winning campaigns, and the professionals who were losing them. But whatever we may think of the military qualifications, the tactics and the strategy of the professional captains, it is impossible to gainsay the administrative and economic enterprise which went into the making

¹ The De la Poles began the purchases in Lincolnshire and Yorkshire, but eventually most of the family possessions were concentrated in East Anglia. Sir John Poultney's purchases were mostly in Kent. Henry Pickard bought land all over the country.

² Dr Lewis, in the University of Sheffield, has been engaged on the subject for some time. An unpublished thesis by Dr Rushton Coulborn, on the 'Crusade' of the Bishop of Norwich in 1383, contains a brief analysis of the composition of the expeditionary force.

and maintaining of their companies. The contractors, who appear to belong to every possible rung of the feudal ladder except, perhaps, the lowest, undertook to find, equip and feed bodies of fighting men for periods which often ran into months and years. The system had many obvious drawbacks. The professional companies attracted the débris of English society, the riff-raff of town and country, and the waste products of every occupation, including the Church, and spelt ruin to the countries in which they operated. But they opened great opportunities for enrichment to the men who ran them.

A margin of profit was probably provided in the terms of the captains' contracts. But, in addition, there were countless openings for irregular gain. To begin with, the terms of the contract with the crown offered the captains every temptation to economize on the provisioning of their troops, and this temptation was often turned into necessity by the delays in royal remittances. The troops, left to their own devices, were often tempted and sometimes compelled to live on the country to an extent which, as the record of the English occupation of Normandy shows, could, even by medieval standards, be thought excessive. But the heavier the burden on the population, the greater were the captains' economies. And in addition to economies in purveyance, there were also prizes of war which were open to amateurs and professionals alike: ransoms and loot. Needless to say not every captain made a fortune, and certainly not every captain lived to enjoy one. But the royal grants and obligations to the military leaders are so numerous as to suggest that it is to them that a great proportion, if not the bulk, of the war expenditure went.

The only other group of the population whose opportunities for war profits or for war profiteering rivalled those of the military men were the gentlemen of the cloth: the royal clerks in charge of purveyance of the navy and the army and of the administration of the war treasuries. Their numbers were never very large, but the company, though small, was very choice. Richard De la Pole belonged to the profession, and William De la Pole was a royal purveyor and a merchant rolled into one. At least six of the men who figured prominently in the syndicates of the wool magnates, Wesenham, Chirton, Quedlinburg, the two brothers Melchebourn, and John Poultney himself, had, at one time or another, acted as officers in charge of purveyance. In addition, there were also clerks like William Burton, Mathew Torkesey, William Wenlock, Ralph Kesteven, William Rothwell and John Hatfield in the fourteenth century, or William Loveney, William Soper and John Feriby in the fifteenth, who operated on the frontiers of the exchequer and the army, and had every opportunity for enrichment.¹

¹ Perhaps the best known of these is William Northwell whose fame was largely based on the Exchequer Proceedings which arose from spurious bills issued and circulated by him. Cf. *P.R.O. Chancery Miscellanea*, 68/1. But there were many other less notorious clerks among the King's principal creditors. Thomas Kent of the middle decades of the fifteenth century was one of the last of the race. Curiously enough, William Philipp, the official Treasurer of the War at the beginning of the fifteenth century, is least prominent among the beneficiaries of the War.

Of these opportunities all of them freely availed themselves. Some of them, like the other magnates, were not allowed to enjoy their newly acquired wealth for any length of time and sooner or later fell victims to royal appetites, but many survived the royal depredations and saved at least some of their wealth.

In the present state of our knowledge it is difficult to be precise either about the numbers or about the riches of the war captains and the clerks, but the employment to which the new riches were put is easy enough to discover. It is almost certain that very little went into industry or trade. It would be useless to search among the hundreds of names of the fifteenth century wool merchants or clothiers for family associations with men who, in the previous generation or two, figured in the royal grants for services rendered in the War. Traces of indirect investment in trade are equally hard to find. England, unlike other European countries, did not develop the specialized legal forms of the 'Commenda' and the 'Societas' to serve the purposes of sleeping partnership and of other types of investment by non-merchants into mercantile or industrial enterprises. But the legal security of the Action of Account, in which the passive partner, or the investor, appeared in the fictitious guise of master or employer, performed the function of a partnership contract and produced a vast mass of evidence of medieval investment. In that mass, names of nobles and gentlemen occasionally occur, but they are no more frequent during or immediately after the Hundred Years' War than they had been in the thirteenth or the early fourteenth centuries, or were to be in the late fifteenth. Most of the transactions are between merchants and merchants. Such 'non-professional investments' as are to be found belong mostly to widows, orphans and spinsters.

In so far as the employment of war profits by the military profiteers can be traced at all, it will be found to be identical with the use to which new riches were put by merchants. War wealth went the way of all new wealth: what was not wasted in riotous living or hoarded in plate and clothes was put into land. Some of the land was in the towns, but most of it was in the country. The captains and the clerks as well as the merchants preferred to invest in broad acres and social elevation. Indeed some of them were given no choice. The Crown was constantly in debt to its servants and to its war creditors, and more often than not paid its debts or rewarded its creditors' patience by grants of land or of reversions. The bulk of the vast land possessions of the De la Pole family, which later became part of the great Suffolk patrimony, was acquired in that way; so also were some of the lands of the famous war captains. Sir John Falstaff, who got much publicity as a result of the royal seizures in the late fifties of the fifteenth century, had received some of his lands from the King twenty or thirty years earlier. Documents also abound with grants to other famous soldiers: John Chandos, William Felton, Thomas Kyriel, Nigel Loring, Hugh Calverley, Thomas Ufford, Reginald Cobham, to say nothing of the feudal leaders, like John de Vere Earl of Oxford. The fortunes of the Vere family, like those of the Beauchamps, the Berkeleys and the d'Umfre-

villes, must have been greatly helped by the wartime enterprises of their members, and by the grants of land in payment of royal war debts.

But most of the new men also acquired land for hard cash. A student passing from the exchequer documents of the late fourteenth and the early fifteenth centuries to the study of the Ancient Deeds or of the recognisances which accompanied transactions in land finds himself among old acquaintances. The names of royal creditors on the Issue and Receipt Rolls occur so frequently in the records of land purchases and leases as to preclude mere coincidence. The identity of names obviously betrays the homecoming of the country's prodigal money. Wealth, wrung from the land in imposts and taxes, was now returning, much shrunk and depleted, to the place from which it came.

IV

The circular tour of rural wealth had obvious social consequences. Even if the war finance did not revolutionize English industry and trade, it could and did affect the composition of rural society. It may have left the class structure unaltered, for it brought to the country new men rather than new classes, and affected the country's social metabolism without altering the layout of its social anatomy. Yet, the importance of the metabolic changes was real and great enough, and their influence was all the greater in that it so often agreed and combined with other contemporary movements.

What these movements were students of economic history well know. The closing hundred and fifty years of the Middle Ages were marked by a profound transformation of agriculture. The manorial system was breaking up all over the country. The capitalist or quasi-capitalist economy in demesnes or monastic granges was invaded and conquered by peasant units. By the end of the fifteenth century labour services, villeinage and cultivation by landlords or estate bailiffs were nearly everywhere replaced by copyholds, leaseholds and rent-collecting landownership.

It would be useless to attempt to explain the agricultural revolution by the effects of the War. What caused it we do not yet know, but all the indications point either to the falling prices, or to the declining population, or to both. Neither the prices nor the population were at the mercy of the War. The prices apparently broke before Edward decided to invade France. Their subsequent depression had very little to do with the war drain on the country's treasure, for it was also observed abroad. What caused the decline of population (if there was one) in the early fourteenth century it is impossible to say. But it is more or less certain that military expeditions did not absorb a substantial enough proportion of the population to make much difference. The English Army at Crécy probably numbered 15,000, the Army at Poitiers was much smaller and could hardly have exceeded 8000. The Army at Agincourt may have reached 10,000. The numbers absorbed by intermediate campaigns and by garrisons were even smaller. The Black Death and the great pestilence of the mid-sixties were infinitely more lethal, but neither could directly be

ascribed to the War. The only direct bearing which the War may have had on the agricultural crisis was in discouraging and controlling investment in agricultural equipment and improvements. But even this was due more directly to the agricultural depression itself than to the action of war taxation.

Yet it would be wrong entirely to divorce the agricultural crisis from the War. Their causes may have been separate and independent, but their effects were not. In the upper ranks of society the impact of the War doubtless amplified and implemented the action of the manorial depression. As most students would now admit, the humbler ranks of rural society must have benefited from the agricultural changes. Wages rose, land became cheaper, average holdings larger. Not so the ruling classes. The decline of demesne agriculture was in itself a sign that circumstances were not favourable to large-scale agriculture. For the manorial lords the period was indeed one of profound crisis. It began with the break in prices in the opening decades of the fourteenth century, and was accentuated by shortage of labour and of tenants in the second half of the century. The falling profits of cultivation led to the leasing out of demesne and of customary holdings, and this produced a fall in land values, which even the demand from the *nouveaux riches* was unable to check.

The crisis was therefore bound to affect the fortunes of the landowning classes, though what effect it had upon their composition can, as yet, be only guessed. In spite of the abundant documentary evidence, the social condition of the ruling classes is the most conspicuous gap in our historical knowledge. The topics of economic history have been determined by the interest of its founders in social reform, with the result that more is now known about the Chartists and the trade unions than about the capitalists and manufacturers, and much more about the medieval labourer than about the medieval landlord. Guesses must take the place of knowledge, superficial impressions the place of proof.

The impression which is, perhaps, least superficial is that of a 'general post', a re-shuffle of ownership and of the effective occupation of landed estates. The magnates found it difficult to maintain themselves on their purely agricultural incomes. Some of them tried to supplement their incomes in other ways. Most of them must have found feudal revenues, profits of courts and of local influence relatively more important as agricultural revenues fell, and offices of state or shares in the spoils of political power must have become more tempting than ever. So also were the profits of the sword for those who could wield it.

It was at this point that the social consequences of the Hundred Years' War impinged upon the social consequence of the agricultural crisis. The magnates, even men as great as the Duke of Lancaster, tried to stabilize their incomes by sub-letting their estates to men small enough to live on them, and substantial enough to afford them. Men of this type were rising to the surface all over the country. Some of them bought demesne farms or whole manors outright; others appeared merely as tenants ('farmers'), but all of them represented a new and rising class. Where they all came from

cannot be said with certainty. We find among them local men of the humblest origin, the 'kulaks' of the English countryside, who had been assembling land piece by piece for many years, and also reeves, manorial officials or other officers of noble households. But many, possibly the majority, were merchants, clerks, or returned captains, in short, the *nouveaux riches* of the War. If the agricultural revolution created the demand for the 'gentry', the War and the war finance were there to provide the supply.

The distant repercussions of the re-shuffle must have reached far outside the confines of rural society and far beyond the span of the Hundred Years' War. It does not require much ingenuity to follow them up through the Wars of the Roses to the political and constitutional developments which accompanied the establishment of the Tudors. The sub-letting of manors raised all over the country a wave of what looked suspiciously like sub-infeudation. Even though the creation of new intermediate fiefs was all but illegal, the new 'farms' and beneficiary leases enabled many a great lord not only to stabilize his income, but also to consolidate his local influence and to augment his following. Some of the great northern families, like the Nevills or the Percys, may have found in the chronic wars with Scotland and in the disturbed conditions of the Border sufficient impetus and sufficient facilities for the recruitment of their great retinues. They may, therefore, not have needed the twofold upheaval of the War and of the agricultural revolution to stimulate either their demand for gentlemen tenants or their supply of suitable candidates. Elsewhere, and above all in East Anglia and the West Country, the decline of the great estates as agricultural enterprises was accompanied by the temporary resurgence of the great fiefs as a political force and by the formation of large, and mostly recent, quasi-feudal retinues. But the future belonged to the retainers and not to their masters. In the political struggle of the Wars of the Roses the 'great connexions' found their doom. As a result of that struggle the new men, who in the preceding two or three generations had succeeded to the commanding positions in rural economy, were also able to succeed to local power and political influence.

In this light the evolution of the landowning classes in the closing century and a half of the Middle Ages, like the evolution of the middle classes in the same period, appears as a joint product of a protracted war and of a deep-rooted economic change. Our main conclusions are therefore obvious to the point of being trivial. In the machinery of social change the War was not so much the mainspring as a make-weight. Wherever its action ran counter to the economic tendencies of the age, as in the development of financial capitalism or the movement of land values, it was on the whole ineffective. Only at points at which changes were taking place anyhow was its influence great and irrevocable enough to deserve the attention not only of the chronicler but also of the social historian.

WAR AND ECONOMIC PROGRESS

1540-1640

By JOHN U. NEF

ENGLAND achieved the position, which she held until late in the nineteenth century, of leadership in industrial technology and the development of heavy industry, largely during the hundred years between the dissolution of the English monasteries and the outbreak of the civil war. The period during which the industrial balance of power shifted most rapidly from the Continent to England began in the early seventies of the sixteenth century and lasted until the great depression in English cloth making in the early twenties of the seventeenth. During this half-century, an early industrial revolution took place. For the character of modern civilization in Great Britain, her dominions, and the United States, it was hardly less important than the one that has transformed economic and social conditions throughout the world in the last hundred and fifty years.

How far can the preliminary industrial revolution be explained by the history of warfare between the European powers in the sixteenth and early seventeenth centuries? How far, in particular, can the contrasts between the industrial development of France and England from 1540 to 1640¹ be understood in terms of war and peace?

For comparing the effects of war with those of peace, the sixteenth and early seventeenth centuries are an especially helpful period. They present contrasts between England and the Continent no less remarkable in political than in industrial history. The hundred years from 1540 to 1640 were a century of almost uninterrupted warfare for most states of continental Europe. Apparently only four years—1548, 1549, 1550, and 1610—were without organized fighting on the Continent or in the Mediterranean.² Twenty-four out of every twenty-five years were years with war. During long stretches of time few men in the leading countries—France, the Spanish Netherlands, Germany, and the principalities of central Europe—trusted their neighbours or even their relatives. For suspicion and hatred, devastation and hardship, there was to be nothing quite like it again until the twentieth century.

While the continental fields, hillsides, and towns were continually overrun and ravaged by armies—marching, camping, and fighting—England was normally at peace for many decades after the accession of Elizabeth.

¹ Some of which I have tried to describe in 'A comparison of industrial growth in France and England, 1540-1640', *J. Polit. Econ.* XLIV (1936), 289-317, 505-33, 643-66; 'Prices and industrial capitalism in France and England, 1540-1640', *Econ. Hist. Rev.* VII (1937), 155-88; *Industry and Government in France and England, 1540-1640* (Philadelphia, 1940).

² For the period 1540-1600, I have depended on C. Oman, *A History of the Art of War in the Sixteenth Century* (New York, 1937), *passim*, and especially pp. 703-5; for the period 1601-40 on G. N. Clark, *The Seventeenth Century* (Oxford, 1929), p. 98.

Mr Hubert Reade tells us that for seventy years 'between 1569, when Elizabeth reduced the Catholic North to obedience for ever, and 1639, when the Covenanters of Scotland forced their way across the Tweed, scarce a shot, if we except the Spanish raid upon Newlyn, was fired in anger upon English ground'. The professional political historian might object that plots to restore Catholicism did not end with 1569. He could hardly take great exception to the general impression which Reade's statement conveys. Nor were extensive engagements fought by English troops on foreign soil during the half-century of the early industrial revolution. Except for the successful clash in the Channel with the Spanish Armada in 1588, English men-of-war and armed merchantmen took part in few serious naval battles. While eight wars raged on the Continent in the late sixteenth and early seventeenth centuries, the English farmed, mined, manufactured, and traded peacefully. To the satisfaction of those unwarlike sovereigns, Elizabeth and James I, the Spanish proverb, 'Peace with England and war with all beside', was almost a literal description of the foreign relations of the great powers of Europe.¹

I

Without the extraordinary technological progress of modern times, the triumph of large-scale industry would have been impossible. War could not be waged on the colossal scale to which we are becoming accustomed without the weapons which science and technology have presented to man. Nor could war be waged on such a scale without the technical improvements that have made it possible to produce the necessities of life with so little physical effort that more than half the energy of great nations can be concentrated directly or indirectly upon the destruction of the enemy.

The Middle Ages were ushered out, modern times were ushered in, amid a host of important inventions. The printing press, the blast furnace, the furnace for separating silver from argentiferous copper ore with the help of lead, boring rods for finding out the nature of underground strata, powerful horse- and water-driven engines for draining mines, railed ways with large horse-drawn wagons for carrying coal, the stocking-knitting frame, the so-called Dutch loom for weaving small wares, new furnaces permitting the use of coal in place of wood in glassmaking, steel making, and brick making, coke for drying malt—these are only a few examples of inventions between 1450 and 1650. Without many of them the early industrial revolution would hardly have been possible. To study the reciprocal relations of war and the rise of modern industry, one should begin by considering to what extent technological improvements in early modern times were made in response to the requirements of warfare and also to what extent the changes in weapons were a by-product of inventive skill stimulated mainly by conditions other than war or the threat of war.

¹ Hubert G. R. Reade, *Sidelights on the Thirty Years' War* (London, 1924), I, 488-9 and *passim*.

On the eve of the Reformation, beginning in 1495 with the battle of Fornovo in which the French King Charles VIII won a triumph in Italy, sweeping changes occurred in the nature and the weapons of warfare. While gunpowder had been used in battle at least as early as the third decade of the fourteenth century, it was not until these campaigns at the end of the fifteenth century that armies went into the field with substantial batteries of artillery and that a large portion of the infantry was equipped with firearms. The changes in weapons and in tactical methods that followed during the almost continuous wars fought on the Continent in the sixteenth century were hardly less complete and rapid than those which have taken place in our own age with the introduction of submarines, tanks, motorized troops, bombing and pursuit planes. It seemed to contemporaries then, hardly less than now, that the nature of warfare changed almost overnight. Just after England had lost Calais, her last foothold in France, the bishop of Arras, whose father had been chancellor to Charles V, spoke of the English soldiers as 'hardy and valiant'. 'But,' he went on, 'what discipline have they had these many years? And the art of war is now such that men be fain to learn anew at every two years' end.'¹

The basic technical inventions behind these changes appear to have been the discovery of gunpowder and firearms of various kinds, particularly cannon. An adequate supply of firearms and of saltpetre and gunpowder became for European princes as indispensable for victory as an adequate supply of brave troops. For the student of the relations between war and technological improvements, it is important to know the conditions under which gunpowder and cannon were invented.

Historical research unfortunately has not yet provided us with a satisfactory answer. We have to depend mainly on inference. We are sure at least that Roger Bacon knew of gunpowder as early as 1249 and Albertus Magnus as early as 1280, long before there is any evidence that the explosive was used for driving projectiles. It is now thought that the knowledge of gunpowder was not derived from the Chinese, the Arabs, or even the Hindus, but was indigenous in western Europe. If this is true, then it is likely that gunpowder was discovered in the age of St Louis, whose active reign lasted from 1236 to 1270. At that time learned Europeans, especially those living west and south of the Rhine and the Alps, and above all those assembled at the University of Paris, were filled with a confidence in the intellect that they were hardly to feel again, at least until the late fifteenth century. The age was wonderfully rich in creative thought, in art, and in scientific discovery. There was much technical improvement in connexion with industry. Water power was coming into widespread use for fulling cloth² and for driving the hammers and the bellows in metallurgy. Whether gunpowder was discovered by someone working with warlike design cannot be determined; but it is possible that, like coke, gunpowder was found in connexion with quite a different purpose from that for which

¹ J. A. Froude, *History of England* (London, 1870), vi, 286.

² Cf. E. M. Carus-Wilson, 'An industrial revolution of the thirteenth century', *Econ. Hist. Rev.* xi (1941), 40, 43-6, 50.

it became famous. While we associate coke with the production of iron, the method of 'charking earth fuel' to rid it of 'all malignant properties' was apparently first successfully practised in Derbyshire in order to dry malt with coal without transmitting an unpleasant taste from the mineral to beer.¹ In any event, the discovery of gunpowder appears to have been the by-product of a movement in science and technology whose objectives were primarily peaceful improvements.

We know rather more about the discovery of cast-iron cannon, destined to play an important part in the warfare of the sixteenth and seventeenth centuries. The earliest artillery was made, not of iron, but of bronze. In the age of St Louis, when gunpowder first came to be known, wrought iron was obtained directly from the ore without being melted down to the liquid stage, and it was not possible to form the metal into a mould, such as was indispensable in making cannon. Tin and copper ore liquefy at a lower temperature than iron ore, and the foundry was evolved in the first place for casting bronze. Church bells, statues, and domestic utensils were cast in bronze before cannon. The early bronze founders contributed unintentionally to the discovery of one of man's most awful weapons.²

After the introduction, at the turn of the thirteenth and fourteenth centuries, of taller furnaces and of water-driven bellows in some of the most important iron-making districts, such as Styria, Carinthia, Bohemia, Lorraine, and Dauphiné, a far more powerful flame was produced than any hitherto known to the medieval smelters. Liquid iron was sometimes obtained by accident. At least as early as the beginning of the fifteenth century, such iron was cast into cannon in Burgundy and the western Rhineland. There is little reason to suppose that the men who designed the more powerful bellows and larger furnaces, the use of which led to the discovery of cast iron, intended, any more than the early bell founders, to provide metal for artillery. Their object presumably was to produce good iron in larger quantities. The iron was wanted by a great number of smiths and other craftsmen engaged in forging and fashioning artistic objects and metal wares for peaceful as well as warlike occupations. The invention of firearms was not the result of a series of steps in which human ingenuity was directed intentionally and exclusively to destructive purposes. Peaceful objectives, even more than warlike ones, may have had to do with the invention.

The development of artillery and small arms on the Continent just before the battle of Fornovo occurred as part of a movement of scientific study and technical improvement which produced the most striking results in connexion with the heavy industries in Germany and the rest of central Europe. Like the earlier movement of technical improvement in the age of St Louis, the objectives appear to have been much more often peaceful than warlike. Between 1453 and 1494 the Continent enjoyed a longer respite from serious warfare than it was to have again for more than two

¹ Cf. Nef, *The Rise of the British Coal Industry* (London, 1932), I, 215-16, 248-9.

² Cf. Charles Ffoulkes, *The Gun-Founders of England* (Cambridge, 1937), p. 2.

centuries.¹ There is no reason to suppose that the needs of war played as compelling a part in the technical development of these four decades as they were destined to play on the Continent during the years of fierce and almost continual warfare which lasted at least from the battle of Marignano in 1515 to the peace of Westphalia in 1648. If war had been the principal spur to invention during the last half of the fifteenth century, we should expect to find many of the new inventions in England, where Englishman was pitted against Englishman in a fierce dynastic struggle lasting from 1455 to 1485. Yet in England this was not only a barren period for peaceful inventions; it was a barren period for all inventions. The technical changes which revolutionized warfare at the turn of the fifteenth and sixteenth centuries were wholly of continental origin. According to the leading historian of the subject, 'It is not too much to say that for over fifty years, from 1455 to 1509, England was completely out of touch with the modern developments of the Art of War.'²

As it came to be conducted in the sixteenth century, warfare raised almost endless new technical problems. The solution of one problem generally gave rise to many others. For the first time in western European history, the technology of weapons became the subject of extensive treatises. Firearms caused wounds that neither Hippocrates nor Galen had had to treat. Surgery was caught without a remedy. The ingenious Ambroise Paré rose to the occasion in spite of his humble origin. As a barber surgeon he was despised by the physicians who belonged to French university faculties. But the French kings, who cared more for their health than for ossified conventions, made him their principal physician and left the faculties to their sterile disputes. When Paré accompanied Francis I to the Italian wars, it was the accepted practice to pour boiling oil on gunshot wounds. At first Paré conformed to the custom. In one of the battles the wounds were so numerous that his supply of oil ran out. Finding the next day that the soldiers he had failed to treat were better off than those he had treated, he had the good sense to abandon oil.³ Like so many great discoveries in science and medicine, including some of those of Claude Bernard, this was the product of simple intelligence. Paré claimed no special merit for the method of dressing wounds which he developed. 'I dressed him and God cured him', was his favourite remark. It has become a classic.

The use of firearms led also to the study of the principles of projectiles. The methods of defending strong places had to be reconsidered. Forts were needed to protect harbours from the fire of battleships. On land it was found that the only successful way of meeting bombardment was by counter-bombardment. Fortifications of a new kind were constructed solely for accommodating guns. The new destructive culverins and other

¹ C. Oman, *A History of the Art of War in the Middle Ages* (2nd ed., London, 1924), II, especially book XI, chap. III; book XII, chap. II; book XIII, chap. II; book XIV, conclusion.

² *Ibid.* p. 424.

³ Francis R. Packard, *Life and Times of Ambroise Paré* (New York, 1926), pp. 26-7.

cannon were capable of reducing to rubble the walls of castles once virtually impregnable, and which had withstood strong land forces in their time. Majestic heights and thicknesses like Carcassonne, one of the glories of the Middle Ages and perhaps the most perfect example of the defensive works completed in the late thirteenth century,¹ became obsolete.

Answers to the unending technical problems raised by the new warfare called for direct experience either on the battlefields or in the workshops and arsenals which supplied the soldiers with arms and ammunition. The technique of warfare became a subject that forced itself upon learned men and even artists. Dürer was not only an incomparable painter and etcher; he made contributions of importance to the technique of fortress construction. His many-sided genius was second only to that of Leonardo da Vinci.

The progress of natural science and the growing interest in observation and experiment in the late sixteenth and early seventeenth centuries, owed something to the acute problems raised by the new and more deadly warfare. But war is only one of a number of stimuli to scientific and technical progress, and it is inclined more readily and quickly than most of the others to interfere with such progress.² Throughout the sixteenth century and at the beginning of the seventeenth, the Italians seem to have made more important advances in the natural sciences than any other people. The great Italian scientists, among them Galileo and Torricelli, the inventor of the barometer, were not backward in studying ballistics and in increasing the knowledge of the subject. Yet it would be an exaggeration to claim that the scientific lives of these men centred round the problems of the new warfare; to claim that, without these problems, they would not have made great contributions to it. The movement of which they were a part was an outgrowth of the new interest in man and the physical world that became most ardent in Italy during the relatively peaceful times preceding the French invasions. If one is looking for the foremost intellectual forces behind the Italian Renaissance of the fifteenth century, are they not to be found in the effort to extend the horizons of the mind and to contribute to the splendour and the style of human life here on earth? It is hardly possible to argue that the wars of the sixteenth and seventeenth centuries were primarily the products of Italian aggression. The response to the challenge of war was, in all probability, a secondary rather than a primary factor in the achievements of Italian science before and during the lifetime of Galileo (1564-1642).³

The importance of Italian scientific achievements in the early modern

¹ Sidney Toy, *Castles: A Short History of Fortifications* (London, 1939), pp. 139-40.

² Cf. G. N. Clark, *Science and Social Welfare in the Age of Newton* (Oxford, 1937), pp. 73-4, and chap. III generally.

³ It is more debatable whether war was a secondary factor in stimulating Italian technological improvements, at any rate in connexion with metallurgy (Cyril Stanley Smith, 'Biringuccio's "Pirotechnia"', *Mining and Metallurgy*, XXI (April 1940), 191). I am indebted to Professor Theodore F. Marburg for calling my attention to this article.

age must not obscure a movement of even greater importance for the rise of industrialism. This was the shift in the centre of progress in both science and industrial technology from the Continent to Great Britain. That shift can be traced back at least as far as the last part of Elizabeth's reign, to a period of exceptionally peaceful conditions for the English nation. During the half-century of the early industrial revolution, more fresh industries were started, more new kinds of machinery and furnaces were developed in England than in any other country. Few of the industrial methods which spread through the country before the civil war were of English origin. But the concern of Englishmen with economic improvements of every kind, their eagerness to derive instruction both from experiences abroad and experiments at home, prepared the ground for later inventions and cultivated a profound and durable interest in natural science, such as no earlier people had possessed. When Voltaire, in his *Siècle de Louis XIV*, turned to the subject of science, he wrote that with respect to the inventions in which he put such high hopes for humanity, the period might be most appropriately called *le siècle des Anglais*.¹ England would hardly have replaced Italy as the leading scientific country in the later decades of the seventeenth century had it not been for the exceptional interest taken by the English in technology and in scientific experiments and observations, an interest which goes back to the reign of Elizabeth.

It would be a mistake to assume that in the Elizabethan Age the problems of warfare were of no concern to the British scientists and economic improvers, who laid the foundations for the later scientific and technological leadership of Great Britain. John Napier, the Scot who is celebrated as the discoverer of logarithms, was absorbed on more than one occasion with the discovery of new means of protecting the island from attack. He applied his learning to the construction of cannon. Among the papers which he left behind at his death, in 1617, were plans for a projectile that was said to have destroyed a herd of cattle at one swoop. Apparently this was either shrapnel or chain shot. He also left a plan for a submarine, with the note that it was 'capable of defending the shores of his native country against the Spanish Armada or any other fleet'.² He seems to have thought even of an armoured car—'a chariot of metal, musket proof'. Shortly after Napier's death, Cornelius Drebbel, the famous Dutch chemist and engineer, established himself in London as a congenial setting for his important scientific studies, and experimented in the Thames near Greenwich with a submarine. We do not know whether his vessel owed anything to Napier's plan, but it is evident that the study of naval improvements was not being neglected in Great Britain.

For all that, problems of warfare seem to occupy a smaller place in English than in continental scientific and technical publications at the turn of the sixteenth and seventeenth centuries. If the urgency of such problems had been the chief factor in the progress of natural science and technology at this time, we should expect the French and the Germans to have been the leaders more than either the Italians or the English. There

¹ *Le Siècle de Louis XIV*, chap. xxxi.

² Reade, *op. cit.* II, 404-5.

were some branches of science in which France did excel England during the hundred years 1540–1640. Mathematics was one of them, and the study of ballistics, with its mathematical issues, may help to explain, in a measure, why the French were better mathematicians than the English. The famous Italian mathematician, Nicholas Tartaglia, who died in 1557, had demonstrated even before 1540 the value of applied mathematics in connexion with artillery and the military art in general.

In spite of the immediacy of the technical problems of war in France, the French were worse physiologists and physicists than the English. They contributed less to the invention of labour-saving machinery and of furnaces designed to cheapen the cost of fuel in manufacturing. Except for Descartes, who spent most of his adult life in Holland, which was nearer to England in its philosophical outlook than any other continental country, French philosophers took only a slight interest in the progress of health and wealth compared with their brethren across the Channel. The English had no surgeon to match Paré, but the French had no natural scientist to match William Harvey, with his epoch-making discovery of the circulation of the blood. This discovery was based on vivisection and experimental science of the kind that had not yet come into favour in France. The conclusions of Harvey's treatise, *Exercitatio de Motu Cordis et Sanguinis*, were generally rejected by the French university faculties. Not until 1649, more than two decades after its publication, did the member of a faculty of medicine in France, Lazarus Riverius, of the University of Montpellier, venture to defend and teach Harvey's theory. This created such a scandal that he was called upon by an adherent of the old school of physiology to resign his chair.¹

While constant warfare, such as was waged on the Continent, created new and intriguing problems for the scientists, the surgeons, and the technicians, it also tended to canalize scientific and technical thought in channels leading to destruction or to defence against destruction. It tended to push aside matters relating to the improvement of health or wealth, and to the study of the basic theoretical issues which have little or nothing directly to do with warfare, and with which modern science at its best has been concerned from the time of Harvey through Pasteur to Einstein. Serious wars interfered with scholarship of every kind. From 1560 to 1589, during the French religious wars, hardly a man was born in France who made his mark as a first-rate philosopher, scientist, or even as a mathematician.² During this period and throughout the eighty years following the accession of Elizabeth and the loss of Calais in 1558, the remarkable progress of science and technology in England was made possible in no small measure by the peaceful conditions that the country enjoyed. Continual wars seem to have hindered the growth of scientific knowledge more than they stimulated it.

¹ Robert Willis, *The Works of William Harvey* (London, 1847), p. xlix. I have in hand an essay from which I have drawn the comparisons in this article between the progress in France and England of science and technology.

² Cf. J. Michelet, *Histoire de France* (Paris, n.d.), xi, 261–2.

Peace seemed to be more conducive than war to great technical and scientific progress. But periods of great technical and scientific progress led almost inevitably to the discovery of new and more deadly weapons. They tempted warlike and hostile peoples and their leaders to appeal to the sword, when geographical and technical conditions enabled them to get at their neighbours' throats. Thus technical progress, unless accompanied by a great decrease in the hatred among men or a tremendous improvement in the moral standards relating to international relations, begets wars on an ever greater scale, with more and more devastating weapons.

II

Werner Sombart has pointed out that historians generally have emphasized the destructive side of modern war as carried on with gunpowder, cannon, muskets, and large armies.¹ He set about to emphasize what he might have called the 'constructive' side. This aspect was likely to strike especially an historian of the Reich, because his country during the past eighty years has been busy invading foreign territory, without the more disagreeable experience of finding enemy armies spreading havoc in Germany itself. His argument is that the growth in the number of men under arms and the increasing cost of supplying them with weapons, food, clothing, and ships of war made it necessary to assemble capital in large units and led to the development of large-scale enterprise in industry, commerce, and finance. Thus, in spite of the destruction it has caused, modern war, based on gunpowder, played a prominent part in the rise of modern capitalism during the sixteenth, seventeenth, and eighteenth centuries.²

Changes in the technique of warfare since the Middle Ages have made necessary the building of more and more costly munitions plants; they have also increased again and again the period of time required to produce the weapons of war. Even in the age of the Reformation the need for new kinds of weapons brought about the concentration of industry in large establishments, which anticipated the factories of the nineteenth century, though such machinery as there was in them was turned, not by steam or hydroelectric power, but by the pull of horses or the rush of water. War promoted large-scale industry both directly and indirectly: directly, because it led to the building of extensive yards for the production of the new armaments; indirectly, because the growing demand for supplies of ore and metal (especially iron, steel, and copper) stimulated mining and metallurgy, which, like the armament industries, could often be carried on to advantage in costly plants, employing a considerable number of workpeople.

In early modern times the arsenal at Nancy, which belonged to the dukes of Lorraine, was among the largest of the new armament works. It was appropriately called 'l'Artillerie', and it was of considerable import-

¹ *Krieg und Kapitalismus* (Munich, 1913), pp. 4 sqq.

² *Ibid.*, *passim*.

ance at least as early as 1503. It was expanded several times during the sixteenth century, and was completely equipped for the manufacture, the repair, and the maintenance of weapons and munitions of every description; with furnaces, forges, cannon foundries, gunpowder mills, and saltpetre shops, and also with corn mills, apparently to supply the numerous working population with flour.¹ The buildings occupied several acres of ground, probably at least as populous as a large compact medieval village.

The description of such an extensive and varied plant, occupying as it undoubtedly did many scores of workers within its walls, is likely to create an impression of complete historical novelty in a person unfamiliar with the recent study of economic history. Such a person retains an impression, difficult to efface, that machines, coal, and large establishments for manufacturing were almost entirely novel in the late eighteenth century. Confronted with a description of a large Renaissance armament work, such as the one at Nancy, he is likely to give modern warfare a pre-eminence in the creation of the factory form of enterprise which the historical facts in no way justify, and which Sombart himself would not have claimed for it. Before the extensive use of firearms in war, the western peoples had had establishments at least as large, and such establishments were of course far from unknown in antiquity. The arsenal at Venice for fitting out men-of-war and merchant ships (with its wharves, launching yards, workshops, and storage houses) occupied space equivalent to several modern city blocks, with the additions begun in 1325, four years after the death of Dante.² To him, it had seemed so dark, so noisy, so filthy, and so vast, that he compared it to the Fifth Chasm of the Inferno, where the barterers in public offices and authority lay expiating their sins in a bath of the foulest pitch.³

The large plant, then, was not a creation of modern war. Nor did the new warfare of the sixteenth century lead *invariably* to the concentration of the armament industries in large plants. In saltpetre and gunpowder making in France, for example, the crown fostered small units of production, scattered all through the country. An inventory taken in 1626, after the death of one gunpowder maker near Aix-en-Provence, shows that his possessions in his tiny cottage consisted of one foul bed, two much-worn coats, four plates and three spoons, besides some crude furniture. In the room where he had manufactured powder were a few tools, two scales, and an old arquebus.⁴ This was *travail à domicile*, with a vengeance. That form of enterprise was common in saltpetre and gunpowder making in France in the reign of Louis XIII.⁵ Even the production of French artillery was sometimes carried on, as had been common in the Middle Ages, by scattered makers under contracts like those which predominated

¹ J.-B. Giraud, *Documents pour l'histoire de l'armement au Moyen âge et à la Renaissance* (Lyons, 1904), II, 100-4.

² F. C. Lane, *Venetian Ships and Shipbuilders of the Renaissance* (Baltimore, 1934), pp. 129-30.

³ *Inferno*, Canto xxi, ll. 1-18.

⁴ Archives départementales du Var (Draguignan), E 1133, ff. 416-19.

⁵ Nef, *Industry and Government in France and England, 1540-1640*, pp. 59-68.

in the saltpetre and gunpowder manufactures. In Languedoc in 1621 and 1622 the consuls at Nîmes parcelled out the manufacture of cannon to a founder in Montpellier, thirty-five miles to the south-west, and the manufacture of cannon balls to two citizens of Alais, thirty miles to the north. At Alais the boring of cannon, like the making of muskets and other fire-arms, was apparently in the hands of smiths.¹

The survival of small enterprises in the new armament industries does not show, of course, that the manufacture of munitions exerted no pull in the direction of the factory form of production. All it does is to put us on guard against exaggerating the force of the pull. There is a more serious objection to giving modern warfare any sort of primacy as a cause for the rise of industrial capitalism in the age of the Renaissance. Large establishments, similar to the arsenal at Nancy, were set up in the sixteenth and early seventeenth centuries in connexion with a number of industries, such as salt making, alum making, and coal mining, which thrived mainly not on war but on peace. The demand for salt grew rapidly with the increase in the size of markets and in the length of sea voyages, because salt served as a preservative of perishable foods, particularly of fish, fetched in the sixteenth century, for the first time, from the Newfoundland banks.² Alum was indispensable for dyeing. The rapid expansion in the market for it at the time of the Renaissance was brought about by the spread of elaborate and rich clothing, bedding, table coverings and hangings, by the spread of luxuries with which no military officer could afford to supply his soldiers. Coal had been used in small quantities in the Middle Ages by lime burners and smiths who lived near to outcropping seams. The great new market for it in Great Britain in the late sixteenth and seventeenth centuries was created mainly by the shortage of firewood and charcoal. Coal was substituted for both in many industries, and above all in the domestic hearth and the kitchen stove. Large armies on the move did nothing to multiply either domestic hearths or kitchen stoves!

The expansion of the salt-making, alum-making, and coal-mining industries contributed to the rise of capitalist enterprise in much the same way as the expansion of the armament industries. The salt works at Salins, in Franche-Comté, and indeed those belonging to the dukes of Lorraine at Dieuze, were hardly less extensive and monumental than the arsenal at Nancy. They involved a scarcely less heavy investment of capital. The one at Salins formed an enclosure which occupied an irregular strip of land three hundred yards long and one hundred yards wide, with Doric pillars and fountains playing in the squares.³

Alum making in Yorkshire in the reign of James I, where the plant was

¹ *Inventaire des Archives départementales du Gard*, E, II, 223, 232; A. Bardou, *L'exploitation du bassin houiller d'Alais* (Nîmes, 1898), p. 15.

² H. A. Innis, *The Cod Fisheries* (New Haven, 1940), pp. 10-11, 15-16, 30, and *passim*.

³ Max Prinnet, *L'Industrie du sel en Franche-Comté avant la conquête française* (Besançon, 1900), pp. 80, 156-8, 168-70, and *passim*. For Dieuze, see Koch, 'Geschichtliche Entwicklung des Bergbaues und Salinen-betriebes in Elsass-Lothringen', *Z. Bergrecht* (1874), p. 163.

apparently modelled on that introduced in 1461 in the Papal estates at Tolfa near Rome, was, as a contemporary put it, 'a distracted worke in severall places and of sundry partes, not possible to bee performed by anie one man nor by a fewe. But by a multitude of the baser sort, of whom the most part are idle, careless and false in their labour.'¹ At the enterprise in Yorkshire in 1619 there were some six or seven alum houses. Each was furnished with large brick furnaces and cisterns, piles of alum stone, coal and wood fuel, and about ten metal pans for heating the liquid derived from the alum stone. Each house cost thousands of pounds to build and equip. Each house employed regularly about sixty workmen, and the annual expense of the fuel and other materials needed to keep it in operation exceeded £1000.

By the reign of Charles I there were several large collieries in Great Britain, each with a hundred or more men on its pay-roll. The largest, the Grand Lease Colliery at Whickham, across the river from Newcastle, probably employed nearly five hundred labourers above and below ground.² A few miles away, at the mouth of the Tyne, the sea-salt works of South Shields were even more extensive than the brine-salt works at Salins. They employed many hundreds of workmen.³

In addition to salt making, alum making, and coal mining, there were a number of industries, such as printing, glass and paper making, soap boiling, brewing, and sugar refining, whose progress did not depend on war orders and which lent themselves in early modern times to the establishment of substantial workshops, some with a score or more labourers. While there were no establishments in any of these industries which cost nearly as much to build and equip as the largest arsenals, or the chief collieries, the progress of each of the industries contributed to the rise of capitalism in early modern times.⁴ Wars apparently interfered with their growth as well as with that of salt making,⁵ alum making, and coal mining. Wars also interfered with the growth of various branches of the textile manufacture (an industry vastly more important in point of the numbers employed than any of the others) and consequently with the expansion of the putting-out system, which encouraged the concentration of capital in large enterprises to maintain warehouses and to keep them stocked with the raw materials on which spinners, carders, combers, weavers, and other craftsmen laboured, for the most part in their own cottages, garrets, and cellars.

As England became the chief country in Europe for technological improvements, during the peaceful reigns of Elizabeth and James I, it also became the chief country for the expansion of most of these industries. Peace was not the only or even the principal explanation. Alum making,

¹ Lansdowne MSS., 152, f. 57.

² Nef, *Rise of the British Coal Industry*, I, 350-80; II, 139-40.

³ Lansdowne MSS. 59, no. 69; *Cal. S.P.Dom.* 1655, p. 36.

⁴ For the relation of the growth of printing establishments to the rise of capitalism, see Henri Hauser, *Ouvriers du Temps passé* (5th ed. Paris, 1927); cf. Lucien Romier, *Le royaume de Catharine de Médicis* (Paris, 1925), II, 80-1.

⁵ Cf. below, p. 29.

like the manufacture of brass, developed because of the presence of raw materials. Coal mining grew because of the unrivalled supply of outcropping coal seams and the growing shortage of wood. But it would be no less one-sided to argue that peace contributed nothing to the prosperity of these industries in England, than to argue that the new warfare had no influence upon the size of the enterprises producing arms.

Two examples of industrial advantages which England derived from the continental wars and the immunity she enjoyed from warfare must suffice. As is well known, the expansion of the new draperies in East Anglia was based on the teachings of Huguenot refugees, driven out of northern France and the southern Low Countries by the religious wars. As is much less well known, the progress of sugar refining in London was caused mainly by the same wars. What brought large-scale sugar refining to England was not primarily, as in the case of the new draperies, the actual immigration of religious refugees skilled in the labour; it was the collapse of the industry at Antwerp. That great commercial centre, where the merchants of the leading towns in Italy, Spain, Portugal, and southern Germany transacted much of their business, had something of a monopoly of the rising manufacture in the north of Europe during the middle decades of the sixteenth century. In the early years of Elizabeth's reign, there were only two small sugar-making houses in London. England got most of its supplies of sugar from Antwerp.¹ But few, if any, of the refineries survived the two sacks of that cosmopolitan city by Spanish and French troops in 1576 and 1583. The markets previously supplied thence were thrown open to new producers in Hamburg, Middleburg, Amsterdam, Rouen, and London. In the English capital several large refineries were built in the decade following the second sack of Antwerp.² Haberdashers, ironmongers, grocers, and merchant tailors combined with Dutchmen of experience to put some of their savings into the sugar industry. More than one of the new businesses represented an investment of several thousand pounds sterling.³ In a paper written in 1593, Richard Carmarden, perhaps the best informed and most reliable of Queen Elizabeth's customs officials, observed: 'Now the English can supply Germany and the Low Countries [with sugar] better cheap than they can supply us.'⁴

With one hand, the continental war lords and their marching armies created a need for large new establishments to furnish war materials. With the other, they interfered with the progress of large new establishments designed to cater to peacetime markets. In some cases, they drove rising capitalistic manufactures out of the war zone and even across the Channel. In a variety of ways the industrial losses of the warring countries were peaceful England's gains.

¹ S.P.Dom. Elizabeth, CCXLV, no. 52; William Read, *The History of Sugar* (London, 1866), p. 9.

² S.P.Dom. Elizabeth, CCXLV, nos. 48, 52; CCLIII, no. 95.

³ *Ibid.* James I, LXXXVII, no. 74 (iv), (v). Mr F. J. Fisher kindly supplied me with transcripts or summaries of these State Papers relating to sugar.

⁴ *Ibid.* Elizabeth, CCXLV, no. 52; cf. Nef, 'Richard Carmarden's "A Caveat for the Quene"', *J. Polit. Econ.* xli (1933), 33 sqq.

What of the indirect effect of the new warfare in stimulating the demand for metal and the growth of the mining and metallurgical industries? The output of iron and copper in central Europe increased rapidly during the last half of the fifteenth century and the early decades of the sixteenth. Styria, perhaps the greatest iron-making centre, was turning out four times as much iron in 1536 as in 1466.¹ In Germany, Hungary, and the eastern Alps, the production of copper probably increased even more rapidly than that of iron. A new method of using lead in metallurgy, invented about 1451,² made it easy to extract silver from argentiferous copper ore, with copper as a joint product. At about the same time the discovery of new and abundant supplies of calamine, the ore of zinc, encouraged the production of brass, in which copper was combined with prepared calamine.

The new need for firearms and other armaments played a leading role in the increasing demand for metal at the turn of the fifteenth and sixteenth centuries. Yet, in spite of the continuous battles on the Continent during the hundred years following 1540, the output of iron in France and Spain grew very slowly, if at all. At the end of the sixteenth century, and again in the thirties of the seventeenth, the fighting and the movement of troops in Franche-Comté, and over the French border in Champagne and Burgundy, caused the temporary cessation of labour at many iron works and the complete destruction of some. The output of copper and other metals in Germany, central Europe, and the Spanish Netherlands, apparently declined. It was only in Great Britain (and perhaps in Sweden) that the production of iron, copper, and brass increased rapidly. We should have to blindfold ourselves to facts to ascribe this rapid growth in England exclusively to peace. One of the principal markets for the iron from south-eastern England was cast-iron cannon, and some of the large guns on men-of-war in the royal navy were of brass. The large cannon foundries in Sussex and Kent, one of which employed some two hundred workmen,³ shipped many, if not most, of their guns to the Continent. Iron arms formed a substantial proportion of all iron wares exported during the reign of Charles I, when war was raging in central Europe.⁴ England was not backward in furnishing the weapons with which foreign armies blew each other to bits. Her peculiar position, and the era of peace which the English people enjoyed, enabled the country to get the material advantages with few of the material disadvantages of war.

Can the striking growth in the output of English iron from 1540 to 1620⁵ be attributed mainly to the demand for arms? Statistics are not available to settle the matter. But much of the iron produced in England during the late sixteenth and early seventeenth centuries, together with that imported in increasing quantities after 1620 from Sweden, was wanted for

¹ L. Bittner, 'Das Berg und Hüttenwesen in Innerberg-Eisenerz', *Arch. öster. Gesch.* LXXXIX, part II (Vienna, 1901), 628-9.

² Walter Mück, *Der mansfelder Kupferschieferbergbau* (Eisleben, 1910), I, 57.

³ Ernest Straker, *Wealden Iron* (London, 1931), p. 163.

⁴ Cf. Sloane MSS., 2103, ff. 247-65.

⁵ Nef, 'The progress of iron production in England, 1540-1640', *J. Polit. Econ.* XLIV (1936), 398-403.

peaceful purposes; for the equipment used in the new industries (among other things for the pans in which the salt and alum solutions were heated), for grates and firebacks in the new hearths which were generally adopted as people turned from wood to coal for heating their houses, and for slabs to mark the graves of persons who died in bed rather than in battle or at the hands of the assassin or the inquisitor. Peace presumably stimulated the growth of population, which was more marked in England than in any continental country, and so increased the productive power of the country and the numbers to be supplied with material commodities. Peaceful, rather than warlike, demands probably contributed more to the increase in the domestic output of metals.¹ It is, to say the least, doubtful whether the market for metal in Europe as a whole would have grown more slowly than it did if the peoples had managed to settle their differences without recourse to war. Many branches of the mining and even of the metallurgical industries were largely, if not entirely, independent of warfare for their orders. Continual warfare shrank some markets for metals and ores at the same time that it enlarged others. The burden of proof would seem to rest with those who contend that long and devastating wars have stimulated the production of metal among the Western peoples as much as long stretches of peace.

The particular relation of naval warfare to the growth of shipbuilding is somewhat similar to the relation of war generally to the progress of metallurgy. After the decline of the navies of Venice and later of Spain, the rising naval powers of the age were Holland and England. The construction of vessels of a hundred tons or more could not be undertaken without considerable capital. So the growth in the demand for ships encouraged the establishment of extensive yards, staffed by a large number of carpenters, nailsmiths, caulkers, and other mechanics, as well as unskilled

¹ Sombart suggests that, in the middle of the eighteenth century, the armament industry was the only very large consumer of iron in England (*Krieg und Kapitalismus*, pp. 108-9). His figures for English iron production are taken from an estimate which Mr T. S. Ashton subsequently showed to refer not to 1740 but to 1720. Mr Ashton also showed that the estimate was a substantial understatement for the output at this earlier date (*Iron and Steel in the Industrial Revolution* (London, 1924), pp. 235-6). I have given elsewhere evidence to suggest that the annual output of iron in England was probably somewhat larger during the three decades preceding the civil war than a hundred years later, at the time of which Sombart is speaking ('Iron Production in England, 1540-1640', pp. 401-2). Sombart assumes that the tonnage of iron annually consumed in armaments was 50% greater in 1740 than in 1683, when it was presumably substantially greater than in the reign of James I. It follows that the proportion of the English iron produced which was used in the armament industries was, in all probability, very much smaller in the early seventeenth century than Sombart supposed it to be in the middle of the eighteenth. What interfered more than anything else with the expansion of the English iron-making industry in the interval was the almost prohibitive cost of producing the metal with charcoal fuel. Had it not been for the shortage of timber in England and the failure to adopt coal fuel in smelting the ore, the output of iron would have been far greater than it was in the early eighteenth century, even without the markets provided by war and preparation for war.

labourers—establishments of which the arsenal in Venice had been the prototype during the Middle Ages. The new men-of-war of the late sixteenth and early seventeenth centuries sometimes cost the equivalent in modern money of fifty and even a hundred thousand pounds sterling to build. Battleships of a thousand tons and more, armed with two or three tiers of culverins, were coming into use before the middle of the seventeenth century. Consequently the growth of the royal navy, like the widespread use of artillery on land, led to the establishment of large plants such as those at Chatham and Portsmouth.

Yet the production of many naval supplies, like the manufacture of saltpetre and gunpowder in France, was not centralized. Sometimes, at least, it was not even subject by law to government control, as the manufacture of saltpetre and gunpowder in France always was. Even as late as 1666, in the midst of naval war with Holland, complicated by plague and fire in London, sailcloth and cordage in Dorset were made for the navy by 'poore men, that cannot for beare theire moneys, but must be payd on delivery'. They apparently worked with looms and other equipment in their own homes, as we see from letters written from Weymouth to Samuel Pepys, who took an important part at this time in the administration of affairs at the navy office in London. The workmen at Weymouth were independent of the naval administration. Pepys's correspondent, a captain representing that administration, complained that unless he could get cash to pay them, they would sell their cloth, as they had done before, to private persons in Bristol, where 'they may have 1*d.* and 2*d.* per yard for it more...than the King gives'. It would seem to follow from these letters that the labourers were not even wage workers, let alone factory hands, and that there was no way of compelling them to labour for the government when they could get a better price in the open market.¹

The persistence of independent craftsmanship in connexion with the manufacture of naval supplies should not blind us to the influence of modern warfare in stimulating large-scale enterprise, any more than the survival of small enterprises in the munitions industry should blind us to the influence exerted in the same direction by the new land warfare. But another question arises concerning the relation of naval warfare to the rise of industrialism. It is perhaps still a matter for debate whether the role played by sea commerce in the development of naval power is greater than the role played by the rise of sea power in the growth of commerce. In his well-known book, Admiral Mahan took the position that in marine matters the naval flag is inclined to follow the merchant and his dollars, rather than the merchant and his dollars the flag.² That is doubtless a generalization that is perfectly applicable only to a civilization dominated by the mercantile outlook on life, and this attitude has not always been dominant in the world as it was in the time of Admiral Mahan. It is ceasing to be dominant in the twentieth century. But in Elizabeth's

¹ S.P.Dom. Charles II, CLVII, no. 46; CLVIII, no. 15.

² A. T. Mahan, *The Influence of Sea Power upon History* 1660-1783 (Boston, 1918), pp. 49-53, 81-2, and *passim*.

reign, England was beginning to adopt this mercantile outlook on life. Such figures as we have for English shipping in the late sixteenth and early seventeenth centuries tend to support Mahan's proposition. While the tonnage of the royal navy about doubled in the eighty years between 1545 and 1625, the number of merchantmen of more than a hundred tons increased nearly fivefold in number, and presumably well over fivefold in tonnage.¹ It was very generally believed by contemporaries, who stated their views in many manuscripts that have come down to us, that the fishing trade and the coastwise coal trade were the two grand nurseries of English seamen. The rapid expansion of both was dependent in a considerable degree upon the maintenance of peace. The east coast coal trade was seriously affected after 1640, first by the parliamentary blockade of Newcastle in the Civil War and later by the raids of the Dutch in the first two naval wars with Holland, in 1652-3, and in 1665-7. During the eight years 1642, 1643, 1644, 1652, 1653, 1665, 1666, and 1667, less than half the normal shipments of coal from Newcastle reached the south of England. De Witt frightened the collier captains in the spring of 1653, when he surprised their fleet of three hundred coal hoys by his appearance off Flamborough Head with nineteen or twenty Dutch men-of-war, some having three tiers of guns. Had it not been for a sudden offshore wind, he might have sent many hoys to the bottom.² In the seventy-five years from 1550 to 1625 the coal shipments coastwise from the north of England increased some tenfold. In the seventy-five years from 1635 to 1710, when England was engaged much more frequently in sea warfare, they hardly increased 50%. The difference cannot be explained mainly in terms of political history. But it is unlikely that the influence of the wars of the second seventy-five-year period was entirely negligible in diminishing the rate of growth. Of the adverse effects of warfare on sea commerce we have further direct evidence in connexion with the French salt trade to the Baltic during the religious wars. In the five-year period 1574-8 the shipments of salt had fallen to less than a fourth what they had been at the outbreak of hostilities in the five-year period 1562-6. Even as late as the five-year period 1595-9 they were little more than a third what they once had been. Not until the period 1605-9 was there a real recovery.³ It is difficult to believe that English shipyards would have been busier than they were during the reigns of Elizabeth and James I if the English navy had been in action as continually as were the armies on the Continent.

While the new warfare contributed to the progress of industrial capitalism in the sixteenth and early seventeenth centuries, the contributions of peace appear to have been greater. England's successful abstention from warfare seems to have facilitated both the growth of large-scale enterprise

¹ Werner Sombart, *Der moderne Kapitalismus* (4th ed. 1921), I, 762; Nef, 'Industrial growth in France and England 1540-1640', p. 308.

² *Cal.S.P.Dom.* 1652-3, pp. 264, 268, 284; 1653, pp. 257-8, 262, 264, 271-9, 283.

³ Nina Bang, *Tables de la navigation et du transport des marchandises passant par le Sund, 1497-1660* (Copenhagen, 1922), vol. II, *passim*.

in mining and manufacturing and the progress of science and industrial technology, which contributed to that growth.

III

According to the German school of thought, the part played by war in the rise of modern capitalism was not confined to its influence upon the scale of industrial enterprise. War also encouraged the concentration of capital in trade and finance. Sombart's argument with respect to trade relates primarily to the supplying of troops with uniforms and food.¹ With the rise of modern warfare, the size of armies grew and also the length of the periods during which they were maintained. At the same time the task of equipping and nourishing the men was taken over more and more by the sovereign political authorities, by the rising national states. Equipment and food had to be assembled on a large scale, and this made the commerce in both more capitalistic than it had once been.

The evidence provided by Sombart in support of his thesis that war promoted capitalistic commerce relates almost altogether to the last part of the seventeenth and the eighteenth centuries, i.e. to the period which followed the early industrial revolution. Uniforms were not worn by the common soldier in England until the Civil War, when they were introduced in the new model army. France and other continental nations were behind England in introducing them. In the early sixteenth century soldiers for the continental armies had been generally recruited in small numbers by persons of means, who served as officers, and who were under contract to the princes each to supply a tiny increment of men, in somewhat the manner of foremen in the English coal mines, who rounded up workmen to labour in the pits above and below ground. Like the pitmen, the soldiers were expected to supply their own equipment in large part, though not their pikes, muskets, other weapons, and ammunition. When the soldiers reported for duty they must have presented an odd and undisciplined appearance, fitted out as they sometimes were each according to his fancy. The practice of maintaining at least the framework of standing armies grew up gradually during the late sixteenth and seventeenth centuries among the princes and other rulers of European states, but it had not been very far developed by 1640.

Nor did the size of armies increase notably in the sixteenth and early seventeenth centuries. Forty thousand troops was about the maximum in a single force at the beginning of the devastating Thirty Years' War.² Tilly had no more than thirty-one thousand in the decisive battle of the White Mountain in 1620, when the Bavarians overran Bohemia and reduced the Czechs to a subordinate political position from which they were not to emerge until after the war of 1914-18. Spinola had twenty-six thousand foot and four thousand five hundred horse in the army that

¹ *Krieg und Kapitalismus*, parts iv and v.

² By 1627 Wallenstein is said to have had nearly 140,000 fighting men. C. V. Wedgwood, *The Thirty Years' War* (New Haven, 1939), p. 219.

besieged Breda in 1624-5, and brought about the famous surrender,¹ in which the victor accorded the vanquished such handsome terms. Velasquez immortalized the moving scene in one of his most celebrated paintings.

Such armies as those of Tilly and Spinola were considered large at the time. And one should often add to their number perhaps twice as many more men, women, and children, servants, grooms, hawkers, tricksters, prostitutes, and vagabonds, who trudged along with the armed forces without participating in the fighting.² But Edward III had assembled at Calais in 1347 an English army at least as large as those of Tilly or Spinola,³ and in 1532, when the Turks invaded central Europe, the armies on each side had been larger.

When account is taken of all the forces raised to fight in the late sixteenth and early seventeenth centuries, it is certain that a considerably greater number of Europeans were under arms on the Continent during the hundred years, 1540-1640, than in the fourteenth century, and that supply had become a more centralized business. The feeding of the armies constituted a great problem. For the most part they seem to have lived on the country. As they were much on the move, it is not likely that their nourishment gave rise to as orderly a commerce as the nourishment in the late seventeenth and eighteenth centuries of the larger standing armies of France and Prussia, on which Sombart laid emphasis.⁴ It was only in connexion with the navies that a regular supply service was set up before the middle of the seventeenth century, as we know from the records of Admiralty stores preserved for us in English archives. But the number of sailors in the royal navy at the beginning of the seventeenth century does not appear to have exceeded seven or eight thousand.⁵ In spite of the promise of good pay, the only method of getting recruits was to organize press gangs to waylay seamen from the merchant ships and other workmen. Men frequently deserted after they were impressed. Far from increasing, the number of Englishmen under arms was greatly reduced during the late sixteenth and early seventeenth centuries, although the population was growing.⁶ The new opportunities for trade in providing the navy with food, fuel, and other stores could have been nothing like as extensive as those associated with the rising London metropolitan market. Its growth in this period was first called to our attention by Professor Gras, and his description was greatly amplified more recently by Mr Fisher.⁷ In the hundred years from about 1540 to 1640, the population of London grew from some fifty or sixty thousand to more than three hundred thousand

¹ Reade, *op. cit.* I, 381-2; II, 382.

² Cf. Wedgewood, *op. cit.* p. 132.

³ Sombart, *Krieg und Kapitalismus*, p. 38.

⁴ Cf. *ibid.* pp. 131-3, 140-2.

⁵ *Ibid.* p. 49.

⁶ According to Froude, the English government had had 120,000 men in the field in the summer of 1545 (*op. cit.* IV, 127).

⁷ N. S. B. Gras, *The Evolution of the English Corn Market* (Cambridge (Mass.), 1915); F. J. Fisher, 'The Development of the London Food Market, 1540-1640', *Econ. Hist. Rev.* v (1935), 46-64.

souls.¹ The city, which had once depended for its necessities upon the surrounding counties, came to draw its fuel from the Tyne and Wear basins and its food from the whole of England and even from Ireland. In connexion with the supply of coal, grain, meat, vegetables, building materials, fish and clothing, the new openings for wholesale dealers in a large way of business dwarfed anything provided by the problem of supplying the largest army on the Continent until the late seventeenth and eighteenth centuries. The conditions of domestic peace in the late sixteenth and early seventeenth centuries had much to do with the rapid growth of the city.

In considering the influence of the formation of armies upon trade, it is not enough to confine ourselves to the markets they provided; we have also to take account of the destruction caused by the fighting and by the movements of troops. The waging of war in early modern times doubtless created temporarily fresh markets on a large scale. It also disrupted, at least temporarily, other markets which had been created by peaceful economic evolution. Professor Coornaert has provided statistical evidence concerning the damage done to commerce by the religious wars in Flanders. The town of Hondschoote, a few miles from Dunkirk, had become a populous weaving centre in the late fifteenth century. Between the 1480's, when the textile industry there was already of some importance, and the 1560's, the annual traffic in cloth increased from some fifteen thousand to some ninety thousand pieces.² The collapse of the textile trade in the hundred years that followed, during which the traffic was reduced to a figure inferior to that of the late fifteenth century,³ was brought about in part by the direct and indirect effects of the wars fought in the neighbourhood, first in the eighties of the sixteenth century and later in the forties of the seventeenth.

Of the direct effects of these wars upon orderly economic relations we have proof. In 1582 hundreds of French troops occupied the town. At that time, and again in the forties of the seventeenth century during the war between France and Spain, soldiers ransacked and set fire to most of the houses; they partially destroyed the cloth and woollen markets and even the church. For years after these catastrophes, industrial and commercial life in Hondschoote and the neighbourhood was continually disrupted by the presence of armed forces on their way to and from battle. The troops demanded food and lodging from the inhabitants, forced some of them to leave their looms, spinning wheels, dyeing vats, and fulling mills to labour for the army, stole cloth and other stores from the warehouses, and robbed messengers and traders carrying stocks of goods. The traffic in cloth dropped from more than eighty thousand pieces annually in the seventies of the sixteenth century to less than twelve thousand pieces annually from 1585 to 1589. After a substantial recovery in the second and third decades of the seventeenth century, the traffic fell from about fifty-five thousand pieces in the early thirties to less than eight thousand

¹ Gras, *op. cit.* p. 75.

² E. Coornaert, *La Draperie-sayetterie d'Hondschoote* (Paris, 1930), pp. 17, 493.

³ *Ibid.* pp. 493-4.

pieces from 1646 to 1649. This time there was no real revival.¹ In 1657 and 1658, numerous French regiments of infantry and cavalry again inundated the region with the scourge of war.

It would be rash to assume that the trade of most, or even many, industrial and commercial centres on the Continent suffered as much as that of Hondschoote in the warfare of the late sixteenth and early seventeenth centuries. The town was part of the Spanish Netherlands, where the textile industry was harder hit and more permanently depressed than in most parts of Europe, with the exception of southern Germany. Dunkirk and its environs have had more than their share of fighting in the course of the warlike history of Europe; by its situation, Hondschoote was on the route of passing armies and more vulnerable to attack and occupation than most textile centres even in Flanders. During the seventeenth century the place might have at least partly recovered its position in the cloth trade, in spite of all these disadvantages, had it not been for changes which had little or nothing to do with warfare. At the end of the sixteenth century, Hondschoote lost the monopoly of a special technique on which its rise to importance before the religious wars had been largely based. At about the same time, the municipal government became far more regulative in character; the *échevins* interfered increasingly with the freedom of enterprise upon which the cloth trade of the place had thrived during the period of its growth.²

There were many places in France where trade suffered a temporary eclipse during the religious wars resembling that at Hondschoote in the eighties of the sixteenth century. Troops might be directed by their commanders to destroy enemy industrial property, as in 1562, when the Huguenots under the Prince of Condé heaved the paper mills at Essonnes, south of Paris, into the river, claiming that the workmen were under the control of the Catholic rector of the University of Paris.³ Trade routes were sometimes dislocated without actual fighting, by the financial exactions of warring factions. In 1594, rebel garrisons at Rochefort and other places along the Bay of Biscay levied such prohibitively high taxes on the salt made locally by the evaporation of sea water, that the officials in charge of the royal storehouses at Le Mans and La Ferté Bernard, who got their supplies by way of the rivers Loire and Sarthe, appealed to the crown to let them bring salt overland some hundred miles from Caen in Normandy.⁴

The proportion of the country seriously affected at any given time by battles and by the movements and the extraordinary demands of armies was small. There was generally a sharp recovery after the troops disbanded or moved on. We have seen how heavily the export trade in French salt from the Bay of Biscay suffered during the last four decades of the sixteenth

¹ *Ibid.* pp. 42-3, 47, 56-9, 493-5.

² *Ibid.* pp. 48-9; H. Pirenne in *Econ. Hist. Rev.* III (1931), 296-7.

³ Henri Stein, 'La papeterie d'Essonnes', *Ann. soc. hist. arch. Gatinais*, XII (1894), 354-5.

⁴ Bibliothèque Nationale, Manuscrits français, 18165, f. 467.

century.¹ Yet the output of cloth and leather goods in Poitou apparently grew substantially at this time.² While the great decrease in the acts entered from 1575 to 1595 in the books of Parisian notaries³ suggests that there may have been a remarkable decline in the business transacted in the capital during these years, the transatlantic commerce from Havre and Honfleur, at the mouth of the Seine, was greater during the time of fierce religious warfare than after Henri IV had established more peaceful conditions.⁴ While the towns of Languedoc, especially Montpellier and Aigues Mortes, seem to have declined in commercial importance during the last half of the sixteenth century, Marseilles had an expanding traffic at least well into the eighties, both up the Rhône valley and by sea with other Mediterranean ports.⁵

It is important not to exaggerate the damage done by warfare to trade. It is equally important to recognize that the damage was by no means negligible. If the peaceful conditions prevailing on the Continent between 1453 and 1494 had been prolonged through the entire sixteenth and early seventeenth centuries, the various continental states, considered together, would almost certainly have been much more prosperous commercially on the eve of the English Civil War than they were. The contribution of warfare to the growth of large markets and to large-scale commercial enterprise was probably more than offset through the harm done to both by fighting, pillaging by troops, and by the fear and uncertainty which the movements of armies created.

It might be supposed that the commercial damage caused by warfare on the Continent would have also had a depressing effect upon the economic development of Great Britain. Yet, as we have seen, the losses on the Continent proved in some cases gains for England. The economic backwardness of Great Britain at the beginning of the sixteenth century, the rich natural resources in ore and minerals and soil which invited exploitation, and the growth in population during the Elizabethan Age, all made the early industrial revolution dependent, at least in its initial stages, mainly upon the use of domestic raw materials and the development of domestic markets. It was not until after the accession of James I, in 1603, that a shortage in native supplies made imports of timber imperative, and not until the twenties that this shortage increased the cost of wood fuel enough to leave the country dependent for a substantial portion of its iron upon commerce with Sweden and other foreign countries.

Extensive international trade in goods easy to carry was, of course, no

¹ See above, p. 29.

² P. Raveau, *Essai sur la situation économique et l'état social en Poitou au XVI^e siècle* (Paris, 1931), pp. 18-21, 41, 43-5.

³ Knowledge of which I owe to Monsieur Jacques Monicat, who had charge of these books in the Archives nationales before the outbreak of the present war.

⁴ P. Barrey, 'Le Havre transatlantique, 1571-1610'; Julien Hayem, *Mémoires et documents pour servir à l'histoire du commerce et de l'industrie*, V^e Série (Paris, 1917), pp. 68-75.

⁵ *Encyclopédie départementale: Les Bouches-du-Rhône*, ed. Paul Masson (Marseilles, 1920), III, 178-82.

novelty for Europe in modern times, and even before the reign of Elizabeth continental markets were essential to the full development of the leading English industry, the manufacture of woollen cloth. But the European conflicts do not appear to have had a devastating effect on English textile production until after the outbreak of the Thirty Years' War in 1618.¹ The great depression of the twenties was much aggravated by the experiment inaugurated under the aegis of Alderman Cockayne, of prohibiting by royal proclamation the export of unfinished cloth, a policy for which the continental wars were hardly responsible. In any case, it is not possible to contend seriously that the English cloth trade in the late sixteenth and early seventeenth centuries would have benefited if the country had gone to war more frequently. In fact, in the forties of the seventeenth century, when Englishmen began to fight among themselves, the cloth trade, together with the coal and salt trades, was disrupted to the great damage of the textile manufacture, as well as the mining and salt-making industries. Continual warfare seems to have done less to promote than to impede the progress of capitalistic commerce.

IV

The more one examines conditions in early modern times, the more one becomes convinced that peace contributed more than war to the progress of the large-scale capitalism which we associate with modern English and American civilization. Freedom from the strain of constant warfare to which the states of continental Europe were more subject contributed to the growth of the economic civilization in which all the European states came to share during the long peace that lasted almost uninterruptedly in so far as western Europe was concerned from 1815 to 1914, if we rule out the short, sharp, and bitter struggle between France and Germany in 1870-1.

It would be easy, and false, to attribute the early English industrial revolution entirely to the contrasts between the political history of England and that of most continental countries. It would be easy, and false, to reach the simple conclusion that peace accounts for the economic prosperity of England, for the rise of large-scale enterprise in industry in the late sixteenth and early seventeenth centuries, while war accounts for the slump in the progress of mining and heavy industry in so many continental countries at this time. Any attempt to tear out two segments from the complex structure of history and treat their reciprocal interrelations is exceedingly artificial. When we consider war and industry by themselves, we get the mistaken impression that political is the chief explanation of industrial history.

The explanation for the differences between industrial development in England and on the Continent cannot be found in any single branch of history. All the main currents of historical development influenced industrial history in varying degrees, just as all the main currents of industrial

¹ I have derived this view mainly from a lecture which Professor Tawney delivered at the University of Chicago in October 1941.

history influenced in varying degrees every aspect of historical development. Other conditions, such as religious, monetary, constitutional, and intellectual history, together with geography and natural resources, not only affected the industrial histories of the various countries; they helped to determine the number and the nature of the wars. War cannot properly be considered, as we have been doing, as an independent factor. It is itself a product of a great number of other factors. Circumstances, which have little to do with warfare, make it easy for some states and difficult for others to wage war or to abstain from waging it.

The circumstances of European political strife made the road relatively smooth for the progress of heavy industry and the growth of large-scale privately controlled enterprise in Great Britain in the time of Elizabeth and James I. These circumstances put various obstacles in the way of similar progress and growth on the Continent. It would be impossible to understand the industrial history of the age without them. Yet other conditions, unrelated to war, were also making such progress and growth more difficult on the Continent than in Great Britain. The great number of internal tolls on domestic trade in continental countries, tolls from which England escaped almost altogether, interfered with industrial growth on the Continent, as Adam Smith was at pains to emphasize.¹ Another handicap developed with the partial exhaustion of the readily accessible argentiferous copper ores and other minerals, which had fed in particular the roots of industry in Germany, Bohemia, Hungary, and the Eastern Alps at the end of the Middle Ages.² The inflow of silver from South and Central America, together with the opening of new mines of copper ore and calamine in England and Wales, offered the European peoples alternative sources of supply.

It has been common to attribute the economic backwardness of Germany and the rest of central Europe in the seventeenth century almost entirely to the Thirty Years' War.³ The opinion frequently expressed, not only by Germans, that Germany's loss of economic and political influence in early modern times was produced by the machinations of James I and the clever diplomacy of Richelieu, greatly exaggerates the intelligence of the one and the power of both. The Thirty Years' War, for which these two men were hardly responsible, dealt devastating blows to economic life throughout central Europe. But the period of rapid industrial and commercial expansion in that part of the world came to an end by the forties and fifties of the sixteenth century, many decades before the outbreak in 1618 of continuous warfare between local sovereigns, supported at one time or another by all the chief foreign powers of Europe. Germany's industrial leadership had waned by the beginning of the seventeenth century.⁴

¹ *Wealth of Nations*, Book v, chap. II, Part II, art. 4 (Rogers ed. II, 499).

² Nef, 'Silver production in Central Europe, 1450-1618', *J. Polit. Econ.* XLIX (1941), 575-91.

³ A mistake against which Sombart protested (*Krieg und Kapitalismus*, p. 6). Cf. Wedgwood, *op. cit.* pp. 510-11.

⁴ Cf. *ibid.* pp. 47-8, 510-11.

If almost complete freedom from warfare, such as the English people enjoyed, had been an indispensable condition for economic progress and the growth of large-scale enterprise in private hands, the economic history of the United Provinces would have been different. Although Holland was almost always at war during the eighty years from 1560 to 1640, her commercial and industrial wealth greatly increased. Prolonged warfare, and especially civil warfare, was undoubtedly a serious handicap to economic prosperity in early modern times. But the historian seeking a just view of historical causes will find that the length and character of the wars, and the nature of a country's participation in them, determine the extent to which they interfere with material progress, and with the growth of private initiative and large-scale enterprise. In general, the longer the war, the greater its intensity, the more it draws the people and resources of a nation away from peaceful pursuits, the more it is fought on the nation's own territory, the more disastrous the terms of peace, the greater the damage that it causes to the nation's economic well-being.

The course of political strife from 1540 to 1640 is not the only explanation for the smoothness of the road toward industrialism in Great Britain, or for its roughness in most continental countries. And, however favourable the mere absence of war was for English enterprise, it cannot be regarded as a positive factor in bringing about the early industrial revolution. For the driving forces we must look elsewhere. One of these was the price revolution which broke in England in the forties and fifties of the sixteenth century, after a long age of more stable prices than any continental country had experienced.¹ Another was the dissolution of the monasteries and the diminution in the wealth and importance of the clergy. This opened many opportunities for large-scale private enterprise; it made it easier to get land on favourable terms for industry; it stimulated the use of capital for purposes that were economically productive.

As the early industrial revolution gained momentum, the necessary technical improvements in connexion with industry and transport were encouraged by the peculiarly favourable disposition of the English mind toward natural science and toward observation and experiment. The abundance of cheap surface coal, though not a positive factor in the same sense as the others, was indispensable to all of them. Without these supplies of fuel the early industrial revolution would have been stillborn. Natural resources and geographical conditions, historical tradition, monetary, religious, constitutional, and intellectual history all played a part in bringing about that revolution. We must not allow our interest in the results of war and the absence of war to obscure their importance.

What tentative generalizations concerning the relation of war to technological developments, to the rise of industrial capitalism, and to material progress generally, can be drawn from this special inquiry into the history

¹ Cf. Earl J. Hamilton, 'American treasure and the rise of modern capitalism', *Economica*, xxvii (1929), 338-57; J. M. Keynes, *A Treatise on Money* (New York, 1930), II, 152-63; Nef, 'Prices and industrial capitalism', *Econ. Hist. Rev.* vii (1937), pp. 183-5.

of early modern times? Sombart was not wrong in saying that modern warfare stimulated large-scale enterprise. His mistake, and that of some other German writers, lay in the assumption that the warlike impulse, between civilized peoples, is an independent creative force behind the rise of modern capitalism. The warlike impulse is not peculiar to the peoples of Western civilization. Wars, alas, have been fought by all civilized peoples. To make warfare, which is old, a leading cause for modern large-scale mechanized industry, which is new, is to misunderstand the true nature of the causal process in history. Our inquiry suggests that continuous warfare with modern weapons is less likely to result in the multiplication of mechanical inventions than a long period of peace. Large-scale mechanized industry is not the product of large-scale mechanized war to as great an extent as large-scale mechanized war is the product of large-scale mechanized industry. In the main, both are the product of other forces; of the expansive tendencies which the western peoples have manifested ever since the Gothic age.

Modern warfare, then, can hardly be justified on the ground that it has contributed to the material welfare of the human race. Doubtless a tenacity of the kind needed to wage war effectively is indispensable to the inventive skill, the organizing ability, and the hard manual labour that have enabled civilized men to raise their standard of living. It does not follow that the exercise of this tenacity in warfare is a necessary condition for its exercise in peaceful material improvement. It is more than possible that, if the Western peoples had managed, unlike other civilized peoples before them, to find a means of settling their differences without recourse to war, their material conditions would be much better than they are.

It would be idle to claim that a nation can survive in a warlike world without recourse to war. The peaceful condition of England in the late sixteenth and early seventeenth centuries was the result mainly of a peculiar combination of happy circumstances, prominent among which were geography, the growth of religious toleration, and the enmity of the powerful continental states for neighbouring countries more easy to attack than England but difficult to conquer. The remarkably unwarlike disposition of two English sovereigns, who cultivated peace often in defiance of the advice of trusted counsellors, proved an advantage at this particular time. It kept England out of active participation in continental quarrels, while the New World of free land, sparsely populated by Indians, that was opening up across the Atlantic, provided an outlet for the expansive tendencies of the British people; an outlet of a kind that no longer exists in the twentieth century. The accidents which protected Elizabeth from disease and the good luck, combined with ministerial vigilance, which protected her from the dagger and the poison of the assassin, and enabled her life to ripen to old age, prevented the outbreak of civil disturbances which, had they come, might have delayed the early industrial revolution, as the actual civil war of the mid-seventeenth century probably helped to delay the later and more famous one.

ELIZABETHAN FOOD POLICY AND THE ARMED FORCES

By BRIAN PEARCE

THE Governments of the Tudors and, still more, of the first two Stuarts, were masters of the art of disguising commonplace, and sometimes sordid, motives beneath a glittering façade of imposing principles.¹ Thus Professor Tawney, discussing the social policy of the English monarchy in the sixteenth and early seventeenth centuries. The 'strong practical reasons' which inspired the Tudor and Stuart monarchs in their attempts to control eviction and rackrenting of peasants have been demonstrated in the same writer's *Agrarian Problem in the Sixteenth Century*.² Besides intervening from time to time in the name of social justice to help members of a class – the peasantry – which was of great political, military and fiscal importance to them, the statesmen of this period are also found trying intermittently to control the trade in foodstuffs, and justifying their 'interference-legislation' with the same arguments about the State's duty to protect the poor against the rich and unscrupulous. Their food-control policy has hitherto, however, escaped analysis such as that which has so greatly clarified our understanding of their attitude towards enclosures. It has been discussed by historians (e.g. Miss E. M. Leonard) merely as a phase in the development of Poor Relief, in accordance with the explanations of it given by its authors in their official declarations. The group of writers whose delight it is to idealize the Ancien Régime in England have been left uncriticized in their interpretation of *this* aspect of its social policy. The 'Book of Orders' for regulation of the marketing of grain, issued by the Privy Council to the Justices of the Peace at the beginning of 1587 and the most elaborate embodiment of the State's policy in this field, has been called 'the apogee of paternalism in the history of the corn trade'.³ But examination of the evidence regarding the origins and circumstances of this Book of Orders and similar measures suggests that not humanitarian feelings only, but also 'strong practical reasons' played an important role here as in enclosure policy.

Owing to the failure of the harvest in the previous year, England experienced during the spring and summer of 1586 a shortage of corn which resulted in grave distress.⁴ The increased demands of London and

¹ R. H. Tawney, *Religion and the Rise of Capitalism* (Pelican Edition, 1938), p. 158.

² Part III, Ch. 1 (a) 'The political and social importance of the peasantry'. See also *Religion and the Rise of Capitalism*, Ch. III (ii), 'Religious theory and social policy'.

³ N. S. B. Gras, *Evolution of the English Corn Market* (Harvard University Press, 1926), p. 236.

⁴ *Acts of the Privy Council*, ed. Dasent, xiv, pp. 59–60, 76, 79–80, 110–11, 119–20, 155.

other growing towns for food supplies made the difficulties greater than in previous years of 'dearth'. In addition to these large consumers, moreover, the State was at this time coming into the food market on a bigger scale than ever before, buying for the armed forces. An expedition had been sent to the Netherlands to assist the rebellion against Philip II's rule. Relations with Spain were straining towards breaking-point, and it was necessary, besides maintaining the forces in the Netherlands, to keep the garrison in the Channel Islands well supplied, to relieve the army in Ireland (where the food situation was even worse than in England), and to keep a large fleet at sea.¹ Extensive State purchases for these services aggravated the shortage. Hunger riots broke out in Hampshire and Gloucestershire.² At Ipswich, where the food shortage was enhanced by a murrain which raged among the East Anglian cattle,³ a crowd of people demonstrated against the shipping of meat for the Netherlands garrisons, and one of the aldermen, William Smarte, took possession of a cargo and distributed it amongst them.⁴ In east Somerset the misery of the poor was very great because a depression in the cloth trade coincided with the increase in food prices, depriving them of work, 'wherby in this tyme of dearthe of corne and victuall they lack their comon and necessarie foode, a matter not onlie full of pittie in respect of the people but of dangerous consequence to the State if speedie order be not taken therein'.⁵

These events must have been disturbing enough to the Queen's Council. But there came along with them an ultimatum from the Contractor for Navy victualling which darkened the picture still further. In a memorial dated 6 May, Edward Baeshe, General Surveyor of the Queen's Victuals for the Sea Causes, estimated that the victualling of four ships at sea for three months (June-August) would cost him, at prices then current, £2633. os. 4d. According to his contract, made at a time when food prices were considerably lower, he was paid at the rate of 6d. for each mariner's victuals for each day, which for this service would amount only to £2100, and he declared himself unable to make up out of his own resources the difference between the two sums. He was entitled to terminate his contract on giving six months' notice, and announced his intention of taking this step.⁶ In a further statement, dated 23 July and sent to Mr Secretary Walsingham and Lord Admiral Howard, Baeshe gave details of the enhancing of prices since his first contract, made in 1565—wheat had risen from 12s. or 13s. 4d. to 33s. 4d. the quarter, malt from 8s. to 18s. or 20s. the quarter, beef from 1d. the pound to 2½d. and more, and so on.⁷ In a third memorandum, bearing the date 31 August, the contractor repeated that it was impossible for him to continue his service on the existing basis and asked for assistance; even were he worth as much as the Mayor and all the Aldermen of London, he asserted, it would soon be all consumed by the cost of victuals and the incidental charges of the victual-

¹ *A.P.C.* xiv, 67-8, 106-7; *State Papers, Domestic, Elizabeth, CLXXXVI*, 1; *S.P.D. Additional* 1580-1625, xxix, 48, 58, 60, 116, 122, 175.

² *A.P.C.* xiv, 91.

³ *A.P.C.* xiv, 44.

⁴ *A.P.C.* xiv, 128.

⁵ *A.P.C.* xiv, 93.

⁶ *S.P.D. Eliz.* CLXXXIX, 8.

⁷ *S.P.D. Eliz.* CXCI, 28.

ling service as they stood at this time.¹ His pleas for consideration were supported by Sir William Winter and William Holstock, two members of the Navy Board, in a report to Lord Treasurer Burghley on 9 September.²

Baeshe's proposal to abandon his contract put the Council in an exceedingly difficult position. It was unthinkable to allow the man who had managed the Navy's victualling for forty years to retire from this vitally important service at a moment when the needs of the Navy were greater than ever and likely to grow, especially as in the circumstances it would probably not be easy to find another man to take up the contract.³ To cancel the contract and revert to the method of purveyance (taking what the monarch required at a special price, lower than the market price, the subject being compelled to accept what was offered) which prevailed before 1565, when Baeshe undertook to serve by 'bargain' instead of 'by commission' would be to invite the very trouble which they feared, for purveyance of supplies for the armed forces had been a great popular grievance.⁴ To give the victualler authority to take what he wanted at an arbitrarily low price instead of competing in the market on an equal footing with other purchasers would merely increase the volume of discontent provoked by his activities. The abandonment of the contract would also mean that a number of incidental charges of the service (transport, perishing of goods, etc.) which Baeshe had borne under the terms of the contract would now fall on the Exchequer. Some other method of overcoming the problem must be found. Winter and Holstock suggested in their memorandum that he be granted an increase in his 'rate' until the end of the year, to be revised then in accordance with the prices of victuals as they should stand at that time. Whatever else might be attempted to cope with the problem, this was, indeed, the only immediately effective remedy, and by a Privy Seal of 19 October Baeshe's 'rate' was raised by one halfpenny, this increment to continue so long as prices did not abate.⁵

In the meantime, however, the Council had been making inquiries with a view to finding ways of overcoming the dearth and so attacking their problem at the root and solving it without imposing new and heavy burdens on the already sorely strained finances of the Tudor State. The Hertfordshire Justices of the Peace replied on 8 June to one of these inquiries that the price of malt had very greatly increased in their county and that this was due not only to failure of the crop but also to the operations of certain maltsters who bought up great quantities of malt and sent it to the London markets.⁶ The harvest of 1586 cannot have been very

¹ British Museum, Lansdowne MS. 48, f. 94.

² B.M. Lansd. MS. 48, f. 95.

³ Actually, Baeshe died during 1587. His death may perhaps have contributed to the difficulties experienced in victualling the ships prepared to resist the Armada in the following year.

⁴ S.P.D. Edward VI, v, 20, 21; S.P.D. Additional 1547-65, xii, 53.

⁵ Lord Treasurer's Remembrancer, Declared Accounts, Surveyor-General of Navy Victualling, Account for 1586 (Public Record Office, Exchequer 351, Roll 2383).

⁶ B.M. Lansd. MS. 48, ff. 116-17.

successful; the symptoms of popular distress reappeared in November and December.¹ Baeshe himself submitted to the Council in December a set of proposals for diminishing the prices of corn. He urged that the Justices of the Peace should be ordered to control all exports of corn, to restrict and control the activities of corn-traders by a system of licences, and to compel all owners of surplus stocks of corn to bring them to market.² In the last two or three days of December 1586, Burghley finished drafting a set of orders to be issued to the Justices of the Peace of every county, for the regulation of the corn markets, and a proclamation explaining this measure to the people at large. The orders are an amplification of Baeshe's proposals: J.P.s must investigate and register all stocks of corn and compel them to be brought to market; cornmasters must consent to sell in small quantities so that the poor can supply themselves, and only licensed merchants and purveyors for great households are to be allowed to purchase large quantities.³ These Orders were approved by the Council on 2 January 1587.⁴ On that day also was published the proclamation which Burghley drafted along with the Orders. 'The Queenes most excellent Maiestie', it began, 'foreseeing the generall dearth growen of corne and other victuals, partly through the unseasonableness of the yeere past, whereby want hath grown more in some countries than in others, but most of all generallie through the covetousnesse and uncharitable greedinesse of such as be great cornmasters and engrossers of corne, using all the subtil meanes they can, to worke their owne present unconscionable gaine against the rules of charitie, which her Maiestie of her princely care and loue towards her people, utterly condemneth, and earnestly desireth to remedie, for the reliefe of the poorer sort. And therefore, her Maiestie with princely care towards her people, having (with advise of her Counsell) had good consideration hereof, doth by this her Proclamation, give expresse commandement and charge unto al such to whom it shall or may appertaine, that such good orders as her Maiestie hath commanded to be devised for that purpose, and now also are sent to all partes of her Realme, bee diligently and effectually put in speedie execution: Signifying withall unto all her good and louing subiects, that if any shalbe founde obstinate or negligent in the due execution, or otherwise in the observation thereof, that then upon due enformation and prooffe thereof made unto her highnesse said Counsell, which she requireth not to be spared by any, having iust cause of complaint, for respect of any person, she hath given special commandement and order, that they shalbe speedily called to answere, and thereupon, according to the qualitie of their offences, shall receive sharpe punishment, whereby others may take example to auoide the like contempt, negligence or other defaults.' After noting that the dearth was

¹ *A.P.C.* xiv, 245, 249, 264, 271.

² *B.M. Lansd. MS.* 48, ff. 134-5.

³ *B.M. Lansd. MS.* 48, ff. 128-31, printed by Miss E. M. Leonard as an appendix to her *Early History of English Poor Relief* (Cambridge, 1900). Professor Gras gives an analytical summary of the Orders in his *Evolution of the English Corn Market*, pp. 236-41.

⁴ *A.P.C.* xiv, 277-81.

much worse in other countries than in England, the Proclamation returns to the attack on 'the great Cornemasters and owners of Grayne, or of other necessarie victual for foode of the poore', and announces that if prices do not come down their goods will be seized and sold at 'reasonable prices . . . for the reliefe of her Maiesties poore Subiects'.¹

It seems to be at least very likely that among the motives which inspired these Orders and this Proclamation was the Council's desire to regulate and restrict the corn trade so as to make easier the victualling contractor's task of getting supplies at a price which he could afford to pay, while endeavouring to compel the great cornmasters to meet the cost of this 'subsidy' to him and concentrating against *them* the popular discontent caused by the activities of all large buyers of corn, including the victualling contractor. It may not be fantastic to see in these measures a typical stroke of Elizabethan statecraft, aiming to safeguard the financial and political position of the monarchy at a moment of great difficulty and danger, and making a virtue of necessity.

This was not the first occasion on which interference with freedom of trade and demagogic attacks against private merchants had been resorted to in order to deal with financial and political embarrassments arising from the State's need for food for its soldiers and mariners. Commissioners sent by Edward VI to examine and reform the state of Calais had been instructed to see to it that the cattle and corn of the Pale should principally serve the need and expenses of the people *and garrisons* there and not be carried into Flanders, in order that the place should victual itself so far as possible and cease to be so chargeable to England as it had recently been.² In 1566, following a report that the cause of the high prices demanded in Sussex for provisions for the forces was the activities of merchants buying for London and other town markets,³ the Council ordered the Commissioners for Ports and Havens to prevent the exportation of any grain, except for the garrison at Berwick,⁴ and a Proclamation was published denouncing people who blamed the increase in food prices on purchases for the State's use, pointing to private engrossers as the culprits and promising a strict investigation of their doings.⁵ The Commissioners for Restraint of Grain and Victuals, whose original function was to stop food supplies going to pirates and whose duties enabled them to get a very full knowledge of the stocks of food in any given area, were ordered by the Council in 1573 to have 250 quarters of corn provided for the Navy,⁶ and on 20 April 1574 Baeshe reminded the Council that they had promised him letters to the Commissioners instructing the latter to help him obtain his wants from those in their respective counties that might best spare the same.⁷

¹ B.M. Lansd. MS. 48, ff. 132-3; Humphrey Dyson, *A Book containing all such proclamations as were Published during the Raigne of the late Queene Elizabeth* (1618), No. 241.

² S.P.D. Eliz. cxxxiv, pp. 337-41.

⁴ S.P.D. Eliz. xxxix, 11.

⁶ A.P.C. viii, 174.

³ S.P.D. Eliz. xxxviii, 31.

⁵ S.P.D. Eliz. xxxix, 15.

⁷ S.P.D. Eliz. xcvi, 81.

After the issue of the Book of Orders there are several examples of this kind of administrative measure. Lord Hunsdon, the Lord Lieutenant of Norfolk, wrote to the J.P.s of his county on 21 February 1587, warning them that the contractor for naval victualling had sent his deputy to Norfolk to collect 1000 quarters of wheat, the same quantity of malt, and 100 barrels of butter, and commanding them to assist him in obtaining his wants, taking the corn from the great cornmasters, broggers and buyers of corn, without grievance to the people.¹ The Justices of Suffolk were ordered by the Council on 19 October 1595, to hold up all sales of butter and cheese to engrossers, badgers and regraters until the Navy Victualler had obtained what he needed.² In October 1596, following a request from the contractors for naval victualling that they should be helped to assemble a store of victuals at the expense of engrossers 'to the great benefit of her Majesty, the ease of the country, and the good example of all others',³ the Council sent a general letter to this effect to all the Justices of the Peace and customs officers.⁴ In the following year, when the Council asked the Deputy-Lieutenants of Lincolnshire to send in an estimate of how much wheat, malt and pease their county could spare for the Navy, it expressed the hope that the figures would be the larger 'for that engrossers were now to be more strictly looked into and restrained than in former times'.⁵ In a letter sent by the Council to the J.P.s of Norfolk at the beginning of June 1600 they are commanded to execute firmly the Orders against engrossers and regraters of corn, and are told that statements that the dearth of victuals is caused by the great quantities transported out of the realm for troops in Ireland are nothing but malicious slanders.⁶ When the abuses of London ale-house keepers, in the weakness of their beer and the greatness of its price, became a crying scandal, it was the Navy victualling contractors who were appointed by the Council to seize all beer which was being sold at more than 8s. the barrel and take it for the Navy, paying Her Majesty's ordinary price of 46s. the tun.⁷

It may be objected that, as the naval and military establishments of Queen Elizabeth never exceeded a few score thousand men (and were rarely greater than a few thousands), it is fantastic to suggest that purchases for their provisioning can have had any serious influence on the food market. But it has to be remembered that the victualling contractors bought supplies for several months at a time, so that even when only a small number of men were involved the quantity of victuals taken out of the market was considerable. Furthermore, the scale of the State's purchases, though puny by modern standards, was quite large for the time. 'The largest single purchases ever made in the early capitalist period were those for armies and navies'; the military-naval demand 'was not limited

¹ Bodleian Library, Tanner MS. 241, f. 28.

² *A.P.C.* xxv, 23-4.

³ Bodl. Rawlinson MS. C. 340, p. 13.

⁴ Bodl. Rawl. MS. C. 340, p. 3.

⁵ Bodl. Rawl. MS. C. 340, p. 6.

⁶ Bodl. Tanner MS. 76, f. 35.

⁷ Bodl. Rawl. MS. C. 340, p. 37.

in its amount by the necessity of selling at a profit', and 'was paid for by the compulsory taxing-power of the states',¹ which, though poor in relation to the total wealth of society, were nevertheless usually richer than other bulk purchasers of food. If the number of men involved was not very impressive, neither was the population of England at that time very great, nor the volume of foodstuffs produced for the market. Communications, moreover, were not so far advanced that a large purchase of food in a particular area could not cause considerable shortage there, relief of which from other districts might not become effective without some delay. (The problem was aggravated when troops were raised from among the peasants and farmworkers, and kept under arms during the harvest period; though their hands were not available to help produce food, their mouths still had to be fed! See Hampden Poulett's letter to Cecil about the Hampshire troops gathered at Portsmouth, 17 August 1599.²) There is plenty of evidence that the victualling of the Queen's soldiers and sailors was really felt to be a heavy burden. For example, when the Justices of the Peace of Kent appealed in August 1593 for their shire to be let off lightly in the assessment for purveyance for the Queen's household they gave as one of their reasons the fact that the Royal Navy lying in the Medway drew much of its victuals from Kent.³ Again, Fulk Aldersey, Mayor of Chester, in a letter to the Council dated 17 March 1595, complained that purchases made in and about his city by George Beverley, victualler of the troops in Ireland, had greatly raised prices in that neighbourhood;⁴ and John Jolles, merchant of London, tendering for the contract to victual the Queen's forces in the Low Countries and Brittany (30 March 1595), offered to make no provision *out of England* during the time of dearth of corn.⁵ That the imposition of special restraints on trade and enlistment of the aid of the J.P.s and Commissioners, with their powers to investigate and coerce, could make a big difference in the Bristol area when foodstuffs were needed for the Army in Ireland is admitted by Customer John Andrewes in a letter to Burghley dated 9 April 1597. It was a bad time of the year to obtain butter in quantity, but if special restraint were to be made thereupon in Monmouth and Glamorgan and in the ports and creeks of the Severn, 100 barrels could be got together before the end of May for £3 the barrel, and before the end of June 100 more at the same price. *Given the assistance of Sir John Ogan and the other Commissioners for Pembrokeshire*, no small quantity of oats might be had in that county for 20s. the quarter. Malt was very dear in Bristol, and the agent sent to collect a supply of it for the Army's beer would need to have the aid of the J.P.s to fix a price where the sellers proved obstinate.⁶

The feudal-bureaucratic monarchy of the Tudors and the first two Stuarts became involved in wars for the defence or furtherance of dynastic

¹ G. N. Clark, *Science and Social Welfare in the Age of Newton* (Oxford, 1937),

pp. 51-2.

² S.P.D. Eliz. CCLXXII, 52.

³ S.P.D. Eliz. CCXLV, 69 I.

⁴ S.P.D. Eliz. CCLI, 61.

⁵ S.P.D. Eliz. CCLI, 80.

⁶ S.P.D. Eliz. CCLXII, 107.

and commercial interests at a time when warfare was changing its character so as to throw heavier burdens on the royal exchequer,¹ and when prices of all commodities, including foodstuffs, were rising. The State had to feed more and more soldiers and mariners, and their food cost more and more. The feudal and semi-feudal revenues of the Crown proved inadequate to the task, and in order to perform it the State was driven to various expedients for 'soaking' those who had the means but were unwilling freely to grant them to the monarchy. At the same time having many powerful and unscrupulous enemies both within and without the country; ruling at a time of intense social disturbance; and lacking the protection of a standing army, these monarchs had to take care to keep down causes of popular discontent, and when they failed in that, to deflect the commonalty's hatred away from themselves. There seems to be some evidence that their food control policy was at least partly dictated by these considerations, i.e. by political and financial calculations, and not entirely by humanitarian feelings, though the latter no doubt played a certain role and though the enforcement of the policy may sometimes have incidentally benefited sections of the poor.²

¹ Cf. R. H. Tawney, *Religion and the Rise of Capitalism*, pp. 82-3.

² There is some evidence that the Privy Council's special concern to revive tillage in the northern Marches was partly due to the fact that the turning of much land in those regions from tillage to pasture reduced both the number of homesteads and the amount of victual (other than meat) available on the spot for the billeting and feeding of the Border garrisons. Trade as well as production needed supervision, in order that such grain as was still produced in the Marches might be kept available for the State's needs; a Border magnate was forbidden to export grain and commanded to sell it to the victualler of Berwick garrison. (See Sir Valentine Browne to Walsingham, 12 August 1583 [S.P.D. Additional 1580-1625, xxviii, 26]; the Dean of Durham to Burghley, 1597 [S.P.D. Eliz. cclxii, 10 and 11, and cclxiii, 55]; and the Council to Sir John Forster, 1 November 1586 [A.P.C. xiv, 245].)

SHORT ARTICLES AND MEMORANDA

LORD DUNDONALD

BY ARCHIBALD CLOW AND NAN L. CLOW

I

AT first sight the opinion expressed by a contemporary writer, that the patent granted in 1781 to Archibald Cochrane, Ninth Earl of Dundonald, was of greater national importance than Watt's engine patent, may seem extravagant. But the primary position now occupied by coal-tar derivatives, with which Dundonald's patent was concerned, and their wholesale displacing of natural by *made* products throughout the nineteenth century, signalizes visionary rather than imprudent thinking.

The object of this essay is to correct a widespread impression that the industrial utilization of coal by-products began after the introduction of coal gas as an illuminant in the opening years of the nineteenth century. It would be more true to say that the production of coal gas was an incident in a succession of attempts to find new uses for coal during the formative period of chemical manufacture in the modern sense of the term, that is to say throughout the latter half of the eighteenth century.

Throughout the later eotechnic era, timber protected with tar or pitch was the exclusive raw material of shipbuilding. Iron was introduced for that purpose in the nineteenth century. The only producers of tar and pitch were states in the north of Europe. These two commodities were essential to a maritime power, such as Great Britain, then entering on the threshold of a turbulent century. In 1703, the countries in possession of the monopoly raised prices of tar and pitch so high that England was forced to look to her North American colonies to provide an alternative supply of marine stores. To this end she offered considerable premiums. To the colonists bounties were offered of from 5s. to 10s. per barrel, and over a 60-year period from 1719 to 1779, the total expended was reckoned at some £1,250,000. Thus the bounty scheme bore fruit, and while subject to occasional setbacks arising from the shortsightedness of the Government, a supply of tar and pitch was assured to Great Britain, who thus avoided consequences of the 'odious Convention of the Northern Nations'. However, Great Britain was still dependent upon external supplies.¹ The possibility of making tar and pitch in a country almost devoid of serviceable timber was out of the question. There remained the basic raw material of palaeotechnic civilization, coal.

The first reference to the possibility of finding new ways of producing tar and pitch is to be found in the *History of the Royal Society* by Thomas Spratt, published in 1667, where the subject is mentioned as one worthy of experiment by the

¹ *Memorandum concerning the Progress, and the Uses of the discovery of Extracting Tar from Coal* (28 May 1785). The memoranda, memorials, and letters, etc., forming the basis of this essay are contained in a collection, mostly of MSS., dealing with the British Tar Company, in the National Library of Scotland. They were kindly placed at our disposal by Dr Henry Meikle, Historiographer Royal for Scotland.

Fellows.¹ Some 30 years later, in the *Philosophical Transactions of the Royal Society*, there is 'An account of the making of pitch, tar and oil out of a blackish stone in Shropshire'² (presumably an oil-bearing shale), communicated by Mr Martin Ele, the inventor of it.

The idea of using coal instead of shale is usually attributed to a German, Becker, who in 1682 proposed, both to remove the disagreeable smell of mineral coal by converting it into a kind of charcoal, and to extract from it a kind of tar which he regarded as superior to that of Sweden.³ Then followed a long series of attempts to make pitch and tar from coal at various centres in Great Britain and on the Continent, in particular at Coalbrooke Dale, Rochester, Newcastle, and Edinburgh. Among the adventurers who attempted to commercialize the process in Great Britain was the Marquis of Rockingham. Other undertakings were initiated at Coalbrooke Dale. Among the experimenters were a Mr Champion, John Clark (brother of Sir James) and lastly, the ubiquitous Dr John Roebuck, the founding of whose Vitriol Works at Prestonpans, near Edinburgh, in 1749 may be said to herald the palaeotechnic era in Scotland.⁴ One can gather from an extract from the diary of Miss Henrietta Zipporah Roebuck that Dr Roebuck and Lord Rockingham were co-experimenters.⁵

Successful commercialization, which brought him no material gain, was due to Archibald Cochrane, Ninth Earl of Dundonald (1749-1831). When Archibald Cochrane succeeded to the ancient earldom of Dundonald in 1778, he acquired little more than the title and the entailed estate of Culross Abbey, Perthshire. Archibald Cochrane's father, the Eighth Earl, 'taking it for granted the Estate of Culross would be secured as the Seat of his family, expended considerable Sums in making very large plantations on the Muirs of the Estate', the ravages of eotechnics having necessitated reafforestation in central Scotland as elsewhere. He hoped that if they thrived they would bring in time, by reason of their nearness to the sea, a large sum to the family.⁶ At Culross there was also good coal, and the family hoped that

by working these coals which are on the Sea side properly, and carrying on a Salt Work, very great Benefit in all probability would arise.⁷

Archibald Cochrane began his career in the army and navy, but in neither of these did he find much to interest him. They had, however, an important influence on the scientific activities of his later life. His son, Thomas Cochrane, said of him:

While serving on the west coast of Africa, my father remarked the destructive ravages made on ships' bottoms by worms, and, from his chemical knowledge, it occurred to him that an extract from pit coal in the form of tar, might be employed as a preventative of the evil.⁸

In the manufactures depending on advancing chemical knowledge Dundonald saw 'sanguine expectations of retrieving the family estates by his discoveries'.

¹ Thomas Spratt, *History of the Royal Society* (London, 1667), p. 221.

² *Phil. Trans.* xx (1697), 544.

³ B. Faujas de St Fond, *Journey through England and Scotland*, 1784, ed. Sir Arch. Geikie (Glasgow, 1904), p. 148; also *Essai sur le Goudron de Charbon de terre*, etc. (Paris, 1790).

⁴ Sir John Dalrymple to Mr Andrew Stuart, Edinburgh, 12 Dec. 1782.

⁵ Private communication from Francis E. Hyde.

⁶ *Memorial from Lord Auchinleck about Earl of Dundonald (Eighth), and Lord Cochrane*, etc. (1771).

⁷ *Description of Culross and its Minerals* (Edinburgh, 1793).

⁸ Thomas Cochrane, tenth Earl of Dundonald, *Autobiography of a Seaman* (London, 1860), p. 36.

This 'led him to engage in a host of manufacturing pursuits', in particular the extraction of tar, pitch, etc., from coal.¹ His scientific capabilities he appears to have inherited from his mother, Jean Stuart, who was more than usually knowledgeable in the technics of her time. When Matthew Boulton, commercializer of James Watt's condensing engine, made his tour of Scotland and Ireland in 1783, he stayed for a month with Dr John Roebuck.² During his stay he dined with Lady Dundonald, who appears to have discussed manufacturing projects on equal terms with 'the famous man at Birmingham', as she called him.

By 1781 the Earl of Dundonald had made his preliminary investigations into the manufacture of coal tar, and in February of that year was granted a Letters Patent under the Great Seal of Scotland. During 1782 the tar works at Culross were put into operation, but Dundonald's affairs, always precarious, had become more than ever involved. Threats of foreclosure by one of the most insistent of his creditors, by name Cuthbert, made it a matter of urgency that he should obtain some additional backing for the tar project. Thus was formed the *British Tar Company*. The initial success of the venture exceeded even the sanguine hopes of Dundonald, and £900 having been expended, sales were opened in September 1782.³

In modern gas and coke oven industries tar is one of the products of the destructive distillation of coal in closed vessels, i.e. subjected to external application of heat. The readily condensed fraction called the tar liquor, also contains ammonia and the aromatic hydrocarbons essential to coal-tar dye and synthetic chemical production. Dundonald made no claim to the invention of extracting tar from coal in closed vessels, but he was the first to put it on a commercial footing.

While the patent was obviously drawn up to cover all possible contingencies, and was in consequence somewhat obscure, there has survived a clear account of actual works erected at Upper Crantson, near Dalkeith.⁴

In a very short time it looked as if the tar works would retrieve the fortunes of the Dundonald family, Dundonald envisaging an expansion far beyond the twenty kilns already constructed at Culross:

We are encouraged to proceed in establishing the manufacture upon a very large scale in different parts of Great Britain and as the cinders or coke after the tar &c. has been extracted, have been found to answer for the iron foundrys, it is at these places that we mean principally to extend our works, but a capital of thirty to forty thousand pounds will in the course of a few years need to be expended.⁵

With only 12 years of a patent still to run this sum was difficult to find. So two courses were open to the inventor: (a) to apply to Parliament for a prolongation of the patent for a further 14-year period, or (b) to endeavour to get the grant of 'a reward adequate to the importance of the discovery, by much the greatest in the chymical, commercial and naval line that has been made this century' in exchange for opening the patent to the public at large. To this end he approached his uncle, Andrew Stuart. Also Sir John Dalrymple, to form a true estimate of the probable profits of Dundonald's activities, 'took accounts of things from his partners, clerks and servants of the work separately', and on returning to Edinburgh went to consult Dr Joseph Black (1728-99), Professor of Chemistry there, who had been twice at Culross and expressed himself as

¹ *Ibid.* p. 37.

² H. W. Dickinson, *Matthew Boulton* (Cambridge, 1937), p. 119.

³ Lord Dundonald to Andrew Stuart, Edinburgh, 11 Dec. 1782.

⁴ Sir J. Sinclair, *Statistical Account of Scotland* (Edinburgh, 1791-9), x, 412.

⁵ Lord Dundonald to Andrew Stuart, Edinburgh, 11 Dec. 1782.

'perfectly satisfied from the convincing proofs he saw that the Tar Scheme was a solid and profitable one'.¹ As Dalrymple's and Black's estimate did not quite tally, they asked Dundonald 'to bring over the Company's Books for Doctor Black, our friend Adam Smith and me to look at'. This re-examination showed that the production of coal-tar was 'one of the most profitable trades in the world'. Dalrymple then went on to outline his ideas of the various courses open to Dundonald, whether to endeavour to obtain (a) a prolongation of his patent, (b) a Parliamentary reward, (c) Naval Contract, etc. Of the possibilities in connexion with the extension of the patent, he says:

I was Lawyer in the House of Commons for Watt's Patent for the Steam Engine, an invention of national importance a trifle to this one, and I remember how easily we got a prolongation. Adam's Cement was still more unimportant, and yet he got it. I consider very well what I say, when I say that from a Naval Nation Lord Dundonald deserves a Statue of Gold.²

In view of the neglect of the chemical aspect of the so-called industrial revolution, it is pertinent to point out that Dalrymple's comparison is not so much an exaggeration as we might be tempted to assume at first sight. To quote Lewis Mumford, 'popular historians usually date the great transformation in modern industry from Watt's supposed invention of the steam engine; and in the conventional economics textbook the application of automatic machinery to spinning and weaving is often treated as an equally critical turning-point'; but it must be considered that coal-tar is now the sole basis of the vast industries of dyeing, explosives, drugs, and perfumes, in almost endless variety. We shall see later that the utilization of by-products of refining the coal-tar liquor had already become a business proposition by the latter half of the eighteenth century.³

As yet the creditors had not been disposed of. They, as Lord Dundonald pointed out, might carry off all the coal and wood both necessary for making tar and barrel staves at the works. Sir John suggested consulting Mr Glassford, a prominent Glasgow entrepreneur and a successor to Dr Roebuck as partner of the Prestonpans Vitriol Works, who was then in London, a suggestion with which Andrew Stuart concurred.⁴ To Stuart's cautious epistle Dalrymple replied with a letter enclosing an estimate from Dr Black. A full statement followed a few days later. This we give more or less *in extenso*.

25th January, 1783.

DEAR SIR,

A conversation which I had lately with Sir John Dalrymple, and a Letter which I have received from my Lord Dundonald, have occasioned my giving you this trouble—They have both expressed their desire that I would give you my opinion with respect to his Lordship's Manufacture of Tar—Without further apology therefore, I shall communicate all I know upon the Subject.

His Lordship did me the honour to call upon me several times, since he first contrived his method for Extracting Tar from Coal; and he consulted with me on the terms of the Specification of his Patent. I must also add, that so far as I know he is undoubtedly the first Inventor of this method of extracting Tar from Coal, and the first person who has reduced it to Practice.

In some of his Lordship's visits to me, he invited me to go to Culross and see his operations; and towards the end of last Summer he gave me a particular and pressing Invitation,—As I had formerly promised this visit, I complied and went to Culross; tho' to be plain with you, I had little inclination to go....

¹ Jean Dundonald to Andrew Stuart, Belleville, 7 Dec. 1782.

² Sir John Dalrymple to Andrew Stuart, Edinburgh, 12 Dec. 1782.

³ Lewis Mumford, *Civilization and Technics* (New York, 1934), p. 3.

⁴ Andrew Stuart to Sir John Dalrymple, London, 18 Jan. 1783.

I...can now give you the following account of Profits as made up with all the attention that is in my power. It is made upon the Supposition that Twenty Furnaces are to be employed.

Expence Weekly.							£	s.	d.
20 Furnaces with all appurtenances cost £1200, the weekly Interest of which is							1	3	1
Repairs of Do. (which appears to me highly stated)							3	15	0
140 Tons of Chow Coal at 3/6							24	10	0
To workmen for charging and Drawing the Furnaces at 8d. p. Ton of Coal							4	13	4
56 Tar Barrels at 3/-							8	8	0
6½ Cwts. of Rosin for Varnish at 24/- p. Cwt.							7	10	0
							£49	19	5

Weekly Produce in time of War.

56 Barrels Boiled Tar at 21/-							58	16	0
140 Measures of Cinders at 1/6							10	10	0
134 Gallons Varnish made of the Volatile Oils and the Rosin at 3/-							20	2	0
							£88	8	0

In time of Peace the price of Tar will fall as I am informed to about 14/- p. Barrel—the 56 Barrels therefore will bring only £39 : 4 : — and the whole weekly produce of the Tar, Cinders and Varnish will be £69 : 16 : —, but the profit will still be very considerable—thus

	£	s.	d.
Weekly Profit in time of War	38	9	6
Annual Do. at 48 Weeks p. Ann.	1846	16	0
Weekly Profit in time of Peace	19	16	6
Annual Do. at 48 Weeks p. Annum	951	12	0

The year is stated at 48 weeks on account of unavoidable Interruptions.

The Tar is in great repute at present, and is bought for the bottoms of Ships at the above price of 21/-, as fast as he can make it. The Varnish is made of the Rosin and the Volatile Oil which is distilled from the Tar in boiling it, and Serves for the Upper Works and for the Masts and Yards &c of Ships; it is also sold very fast at the above Price.

I found my Lord until he could dispose of his Cinders was employing them in the Boiling of Salt. But my Lord in his Letter to me dated the 20th Curr., acquaints me that he has been selling them for some time past to the Salt Pans at 1/10, and that he has now opened a Sale for them to Leith and other places at 3/- for Drying Malt &c., which if it continues will make a considerable addition to the Profit.

But there is one Article omitted above, which is a quantity of Volatile Alkali (one of the component parts of Sal-ammoniac) which is formed in the Water condensed along with the Tar from the Vapour of the Coals.

This Volatile Alkali, after being somewhat refined or purified from the oil and water, can be employed in the manufacture of Sal ammoniac; and my Lord having sent a specimen of his prepared or purified Alkali to Messrs. Hutton & Diary¹ who manufacture Sal ammoniac here, I know that they found it good for the purpose and made his Lordship an offer for a certain quantity annually, the consumption of Sal ammoniac being limited. But I do not know what offer they have made, or what profit this article is capable of yielding. They have hitherto extracted their Volatile Alkali from Soot, which is also produced by the condensation of Vapours from Coals.

¹ Cf. J. Kay, *Original Portraits* (Edinburgh, 1842), I, 55.

I endeavoured to dissuade him from the pursuit of these for the present, and advised him to attend to the branches of his manufacture which had already succeeded and were bringing in money. He writes me accordingly that he has kept his four Furnaces going, and that the produce continues as much as is above stated.

These four Furnaces contain altogether 14 Tons of Coal and can be wrought off easily twice a week.¹

The details given by Dr Black in this letter still left some doubt, concerning variation of the price of tar between times of peace and war, in the minds of Stuart and Glassford. Glassford was deputed to collect data. This he did, and prices of tar and pitch 'taken from real sales' were forwarded to Dr Black and Andrew Stuart, who, while now wondering if estimates drawn up on the assumption that twenty furnaces be built would be the same for only four, admitted that he now thought that 'upon the whole the work would be profitable and carried along with it this additional advantage, that the outlay of Money for producing that profit was not very considerable'.²

It still remained for Lord Dundonald and his partners to decide which course would be to their greater advantage, i.e. extension of the patent or request for premium. To this end James Cochrane, Dundonald's brother, after consultation with Adam Smith and Dr Webster, prepared a long document,³ setting out the pros and cons of the various courses. He decided in favour of a request for a premium. An item which weighed heavily was that it would throw the patent open to great foundries at Sheffield, Birmingham, etc., thus gaining their support. The following is the gist of his argument:

At present in all the Foundries of Great Britain it is necessary to *char* Coal before it is fit for the various purposes it is used in working up & tempering Metal. The process of *charring* such Coal at present throws off in Airs what by Lord Dundonald's Invention is converted into Tar and charred equally well at the same Time.

Upon a moderate Computation in the three Capital Foundries of both Countries, viz. Coalbrooke Dale, Carron & Rotherham they charr above 150000 Tons of Coal every year. Likewise in the inferior Foundries & the Works carried on at Birmingham, Sheffield, &c. &c. at a very moderate Computation they charr above 200000 Tons more. According to these Computations therefore the Tar that might be extracted from 350000 Tons of Coal is now expended in *Airs* which allowing at the Rate of 3 Tons of Coal to the Extract of one Barrel of *Tar* will produce 116666 Barrels of *Tar* which is more by 16000 Barrels than will be consumed of such *Tar* in the whole *Naval & Merchant Service* of Great Britain.

At the rate of one Guinea pr. Barrel which is the price that Dundonald now receives for His, such Waste in money now amounts to 116666 Guineas.

The interrelationship between tar and iron trades was dealt with by Sir John Dalrymple.⁴ His opinions are based upon the work of Dr Black. According to Dalrymple:

The best judge, perhaps in Europe, of the merit of such inventions, I mean Dr. Black, professor of chymistry in Edinburgh, who has examined Lord Dun-

¹ Dr Joseph Black to Andrew Stuart, Edinburgh, 25 Jan. 1783. There are discrepancies in the arithmetic of the accounts quoted.

² Andrew Stuart to Dr Black, London, 7 March 1783.

³ James Cochrane, *Facts and Hints concerning Lord Dundonald's Extract of Tar from Coal* (1783).

⁴ Sir John Dalrymple, *Addresses and Proposals on the Subject of the Coal, Tar and Iron Branches of Trade* (Edinburgh, 1784).

donald's and Mr. Cort's processes¹ gives me leave to say that, so far as he can judge from the opportunities he had of examining them, they appear to him compleat, and easy and cheap in execution, and that Lord Dundonald produces excellent tar for the bottoms of ships.

The advantages of the above three discoveries combined, give the command of the iron trade of the world to Britain, and take it for ever, or, at least as long as the industry and liberty of Britons remains, from the northern kingdoms, and from America; because Britain is the only country hitherto known, in which seams of coal, iron-stone, or iron-ore, and lime-stone (the three component parts, or raw materials, of which the iron is made) are frequently found in the same field, and in the neighbourhood of the sea, or of short water carriage to the sea.

James Cochrane also suggested that a pamphlet should be published setting forth the advantages of Dundonald's tar, and sent to principal coal proprietors and proprietors of foundries around Sheffield and Birmingham.² In 1785, as a result, Dundonald published *An Account of the Qualities and Uses of Coal Tar and Coal Varnish, with Certificates from Ship-masters and Others*. After giving an account of the success of Dundonald's method, the pamphlet goes on to enumerate the other by-products of coal distillation and suggests uses for them. The by-products include coke, lamp black, ammonia, sal ammoniac, Glauber's salt, and fossil alkali. Many uses for tar were mentioned, including preservation of wood in the form of ship-bottoms, buoys, jetties, cart and waggon wheels, shingle roofs (especially in the West Indies), and in preventing corrosion of iron objects such as ship's bolts and anchors, guns, shot and shells, iron rails in streets, and fire-engine cylinders.

The greater part of the pamphlet is taken up with 'certificates' in favour of the tar. Some idea of the scale on which the trials had been carried out can be gathered from a letter from a Kincardine shipbuilder, who reveals that he and a neighbouring shipbuilder had between them treated some fifty to sixty ships with tar from Culross. The use of tar products was not confined exclusively to marine works. A japanner, John Stobie, of Mill's Close, Canongate, Edinburgh, stated that the 'hard black' which the company had sent him 'answered his japan exceedingly well'.

Lord Dundonald then presented a petition to Parliament, and a committee was appointed to examine the matter. They questioned Dr Bryan Higgins and Mr George Dyer, a London merchant deputed to express the opinion of Mr William Menish, 'principal Chymist in London'.³ As a result, Dundonald's patent was extended, to run for a further 21 years from 1785, and the British Tar Company continued to pour out considerable sums of money on their undertakings. By 1788 they had expended £22,400 on tar works in England and Scotland, and these were reckoned to yield '£5000 of clear annual profit'.⁴

The British Tar Company's method of working was to erect tar kilns in the neighbourhood of various iron works. Reference has been made to the kilns at Upper Cranston.⁵ The first such makers of tar in Scotland were Smith of Dronagan and Cunningham of Enterkine, Ayrshire, neither of whom, however, made it a financial success. In England a company was also tried, and there, as in Scotland, they associated with a foundry to absorb the coke they produced.⁶

¹ The two patents of Henry Cort for the manufacture of malleable iron from coke-smelted ore, by means of pit coal.

² James Cochrane, *Facts and Hints*.

³ *Report of Committee on Petition of Archibald Earl of Dundonald*.

⁴ Lord Dundonald to Andrew Stuart, 10 May 1788.

⁵ Sinclair, *Statistical Account*, x, 412.

⁶ *Session Papers*, Signet Library, Edinburgh, 220—20, 443—61.

The enterprise begun at Enterkine moved nearer to Muirkirk Iron Works, where forty-five kilns were put into operation, each yielding in the course of a year about 360 tons of tar.¹ These Muirkirk kilns had an interesting history. In a letter from Georgina Keith Macadam, quoted by Roy Devereux in his biography of J. Loudon Macadam, famous for his theory of highway construction, it is stated that Macadam, who was Dundonald's second cousin, cooperated with his kinsman in connexion with his experiments. The tar works at Muirkirk were established in 1789 through J. Loudon Macadam on the lands of Kaims adjacent to the Muirkirk Iron Works. Macadam was tacksman of the Kaims Colliery, and the British Tar Company was to obtain enough coal from the colliery for their kilns, and Muirkirk Iron Works, founded the previous year, were to take the coke. Matters did not always run smoothly between the two enterprises, and the differences eventually led to litigation.²

The tar kilns appear to have proved profitable for a number of years. By the beginning of the nineteenth century, however, the British Tar Company, at least at Muirkirk, was in financial trouble and Macadam was suing Dundonald for money.³ Probably as a result of this, Macadam became the possessor of the Muirkirk Tar Works. By 1829 the Muirkirk company had given up its lease and abandoned the kilns, ruins of which were still to be seen in 1936, when, from the stones of which they were built, a cairn was erected to the memory of J. L. Macadam. 'Tar-macadam' was a later development with which Macadam was not connected.

The stumbling-block to the advancement that Dundonald had hoped for was the refusal of the Admiralty 'to make use of his preservative', and an interesting sidelight on the reasons why *coal varnish* was not more frequently employed is the answer which Richard Kirwan obtained to his enquiries: 'I have been informed the principal reason is, that it succeeds too well; the ships not requiring such frequent repair.'⁴ It was only in 1822 that the British Admiralty saw fit to inquire into preservative, and requested the Royal Society to appoint a Committee to report.⁵ The Society appointed Sir H. Davy and other eminent men of science, who reported favourably, but too late to retrieve Dundonald's fortune.⁶

II

Dispersion of his energy was undoubtedly one of Dundonald's faults. While busily engaged in the development of the British Tar Company, he found time to write a pamphlet on *The Present State of the Manufacture of Salt*.⁷

Thomas Cochrane tells us that his father carried on extensively and simultaneously a wide range of manufacturing transactions resulting from applications of chemical science to technics. Among these were the conversion of sea salt into soda as a substitute for barilla, till then the principal alkali used in soap and glass making.⁸ The focus of another group of his manufactures was the production of dyers' and printers' ancillaries. These include making alum as a

¹ Sinclair, *General Report*, App. II, 312; *Statistical Account*, VII, p. 606.

² *Session Papers*, Signet Library, Edinburgh, 220—20, 443—61.

³ *Ibid.* 209, no. 6, 18 Jan. 1800.

⁴ Richard Kirwan, 'Experiments on the composition and properties of carbon in bitumens', etc. in *Phil. J.* I (1797), 487.

⁵ C. R. Weld, *History of the Royal Society* (London, 1848), II, 362.

⁶ *Council Minutes* (Royal Society), x, 4, quoted by Weld.

⁷ Among the Dundonald Papers in the National Library of Scotland there is a fragment of an amended copy of *The present State*, with corrections, probably by Andrew Stuart.

⁸ Thomas Cochrane, *Autobiography*, p. 37.

mordant for silk and calico printers, and an establishment for preparing *British Gum* as a substitute for *Gum Senegal*, a French monopoly produced exclusively in Senegambia, the price of which advanced from £150 to £400 per ton during the French wars.¹ Early in 1801 he convened Glasgow calico printers and gave them an account of his discoveries. At the meeting several resolutions were passed so that Dundonald's discoveries could be used to the best advantage and benefit to the inventor.² From the lichen residue it was proposed to make soap, and it is possible that Dundonald may have had some connexion with the patent for making soap from fish which in 1798 was granted to Sir John Dalrymple in the name of John Crooks.³ Dalrymple, it will be remembered, played an important part in advancing the affairs of the British Tar Company.

Dundonald's interest in paints and pigments extended beyond the production of pitch and coal varnish, but none of his enterprises brought him pecuniary advancement. In 1799 he presented to his friends and to men of science a single quarto sheet entitled *Prospectus or Index to Lord Dundonald's intended Publication*. This publication was to give a 'detailed account of his discoveries, processes and patents, and of the circumstances which have hitherto prevented their becoming beneficial either to himself or the public'.

Dundonald came near making several important contributions to technics which were left to others to develop. One such is described by his son:

An experimental kiln was erected near the Abbey (Culross), and here coal-gas became accidentally employed in illumination. Having noticed the inflammable nature of a vapour arising during the distillation of tar, the Earl, by way of experiment, fitted a gun-barrel to the eduction pipe leading from the condenser. On applying fire to the muzzle, a vivid light blazed forth across the waters of the Firth, becoming, as was afterwards ascertained, distinctly visible on the opposite shore.

This was, however, not utilized, and some years later William Murdoch, an employee of Boulton and Watt at Birmingham, independently developed the utilization of gas made from coal. Murdoch, himself a Scot, maintained that he was ignorant of Dundonald's activities.⁴ This much is certain. On one of his visits to London (c. 1782), Dundonald visited James Watt at Handsworth, near Birmingham. There, in the presence of Thomas Cochrane, the utilization of gas lighting was discussed.⁵ It seems more than a coincidence that Murdoch was entirely ignorant of even the germinal idea of this development. Needless to say, this does not detract from the credit due to Murdoch for his part in stimulating the large-scale application of gas lighting.

When Murdoch suggested patenting his invention, he was advised not to do so by James Watt, Jr. In 1804, Frederic A. Winsor obtained a patent. His patent, excepting the additional reference to collection of gas, is almost the same as Dundonald's tar patent. According to Arthur Elton,⁶ Winsor specified:

An improved oven, stove, or apparatus, for the purpose of extracting inflammable air, oil, pitch, tar, and acids from and reducing into coke and charcoal all kinds of fuel.

¹ *Directions by Lord Dundonald for Extracting Gum from the Lichen, or Tree Moss, etc.* (Glasgow, 1801).

² *Phil. J.* v (1st Series, 1802), 228.

³ *Ibid.* iii (1st Series, 1800), 108.

⁴ 'Utility and advantages of gas-lights', in *Phil. Trans.* (1808), p. 124.

⁵ Thomas Cochrane, *Autobiography*, p. 40.

⁶ Private communication.

After describing how coke, tar and other by-products can be obtained by distillation of coal, he goes on to say:

The inflammable gas or air being purified from that of carbon so pernicious to respiration and dwellings may be led and conducted in a cold state through tubes of silk, paper, earth, wood, or metal to any distance in houses, rooms, gardens, places, parks and streets, to produce light and heat.

Winsor lists the uses to which the various products can be put: charcoal for gunpowder; pitch and tar for preserving wood; wood or vegetable acid for making alum, vitriol and copperas, for dyeing and tanning; ammonia for many purposes. Winsor was primarily interested in coke, and proposed building ovens in the neighbourhood of coalfields after the manner of the British Tar Company. To begin with he only mentions lighting streets with gas as a subsidiary activity.¹

Considering the activities of the British Tar Company, it is not surprising that the latter intimated their intention to oppose the Bill which Winsor attempted to get through the House for the formation of the Chartered Gas Light and Coke Company. The Bill was however lost at the third reading.

While Dundonald failed to implement experiments which might have earned him the title to rank as the inventor of coal-gas lighting, he did place on a commercial basis an industrial enterprise which we are prone to regard as a by-product of commercialized gas production. In this field his creative activities throw a new light on the social background of Priestley's contemporary researches on the properties and constitution of ammonia, and the later popularity of Humphrey Davy's lectures on agricultural chemistry.

From manufacturing pursuits Dundonald finally turned to agriculture. His publications in that field are in the direct line of the advance of scientific agriculture initiated by Francis Home, Professor of *Materia Medica* in Edinburgh, and developed in the later works of Davy and Liebig, the former of whom had advantage of official position denied to Dundonald.

Even in this field he kept the production of tar and coke in view. Accum tells us:

The Earl of Dundonald has shown that, in the application of burning lime, a quantity of coke uniformly burned a given portion of lime-stone in one-third part of the time that the quantity of coal from which the coke had been made could do.²

In other processes too, coke became a desirable substitute for coal, particularly in baking bricks and drying malt. An account of these, and also the making of plaster of paris, was published by Davis in the *Philosophical Magazine*.³

At Cambridge, large quantities of coal were converted into coke and sold in the town and neighbouring villages for drying malt. Here, in 1792, coking was done in ovens, although many decades passed before the vastly greater quantities of metallurgical coke were produced in ovens and the by-products collected.⁴

From coal as a raw material, yet another product was obtained by Dundonald, sal ammoniac or ammonium chloride (NH_4Cl), used by metal workers in tinning cast iron for culinary utensils and for tinning brass and copper. A certain

¹ F. A. Winsor, *Pamphlet* (London, 1804).

² *Treatise on Gas Light* (London, 1819), p. 161 (F. Accum).

³ *Phil. Mag.* xxxiii (1809), 433.

⁴ R. Watson, *Chemical Essays* (London, 1782-7), II, 339.

amount was also absorbed by pharmacists and calico printers. Beckmann, in his *History of Inventions and Discoveries*, says:

If I am not mistaken, the first real manufactories of sal ammoniac were established in Scotland; and the oldest of these, perhaps, was that erected by Dovin and Hutton at Edinburgh in 1756, and which, like many in England, manufactures this salt on a large scale.¹

This refers to a co-partnership formed some time before 1749 by James Hutton, the celebrated Scots geologist, and a Mr Davie in Edinburgh.² Soot was then the raw material used. By engaging in this manufacture, Hutton made sufficient money to give him the leisure to engage in geologic speculation. Reference to manufacture of sal ammoniac in Edinburgh and green glass vessels is made in a letter from John Findlay, secretary to the Duke of Richmond, to George Macintosh (1786), father of the inventor of the 'macintosh', and it is suggested that the vessels were probably old vitriol bottles from Dr Roebuck's works at Prestonpans.³ Messrs Hutton and Davie were still in operation in 1783. In that year they began purchasing sal ammoniac from Dundonald's tar works.⁴ Dundonald's sal ammoniac was, as already mentioned, one of the by-products of tar manufacture. For making it he obtained either hydrochloric or sulphuric acid from Glassford of Dougaldston, as one can infer from the following note in a letter from Dundonald to Andrew Stuart:

My partners and I have it in our Power to render him (Glassford) very essential service by purchasing from him annually some Thousand Pounds worth of a commodity he manufactures concerning which I shall explain myself more fully when I have the pleasure of seeing him in Scotland.⁵

At this time Glassford had become a principal partner in the Prestonpans Vitriol Company, Roebuck having been forced to sever connexion with it on account of financial difficulties.

Dundonald sent William Kinnaird, chemist and apothecary, to London in 1784 to learn the best way of making sal ammoniac. Dundonald and his two brothers, John and Alexander, who were already in the British Tar Company, were to join Kinnaird in the manufacture, but difficulties arose over his salary, and it is said that he did everything he could to spoil the manufactory as he wished to start on his own.⁶ The method of manufacture employed by Dundonald was probably that invented by M. Leblanc of St Denis, near Paris, which consisted of using a brick kiln to vaporize the hydrochloric acid by the action of sulphuric acid upon sea salt which he could obtain from his own pans. Dundonald's ammonia was produced by the action of heat upon nitrogenous matter in coal, in contradistinction to Leblanc who got it by destructive distillation of organic matter.⁷ None the less, soot continued to be used as a raw material, both by Hutton and Davie, as also in a new manufactory which was founded by Charles Macintosh at Glasgow in 1786, in partnership with his father George Macintosh, founder of the Cudbear and Turkey Red Works, and Mr William Couper, an eminent surgeon in that city, who became managing

¹ J. Beckmann, *History of Inventions and Discoveries* (London, 1846), iv, 383.

² J. Kay's *Portraits*, i, 55.

³ George Macintosh, *Memoir of Charles Macintosh*, F.R.S., of Campsie and Dunehattan (Glasgow, 1847).

⁴ Dr Joseph Black to Andrew Stuart, Edinburgh, 25 Jan. 1783.

⁵ Lord Dundonald to Andrew Stuart, Edinburgh, 11 Dec. 1782.

⁶ *Session Papers*, Signet Library, Edinburgh, 380, 37, 7 Sept. 1797.

⁷ Andrew Ure, *Chemical Dictionary*, Article, 'Ammonia'; *Ann. Chim. (Phys.)*, xix (1797), 61; Samuel Parkes, *Chemical Essays* (London, 1815), iv, 339-95.

partner. In addition to coal, urine was utilized as a raw material on account of the ammonia which could be derived from it. According to Samuel Parkes, British manufacture of sal ammoniac to replace what was formerly imported from Egypt, developed particularly in Scotland 'where it was formed by a peculiar process from soot; and also from a variety of refuse animal matter'.¹ The Macintosh factory continued for a number of years, but it is probable that more scientific methods of making sal ammoniac led to its closing down.² At any rate, according to Sir John Sinclair, by 1814 there was only one sal ammoniac works of any size in Scotland, and that was at Bo'ness.³ Here a Mr Astley operated a process similar to that described in the *Annales de Chimie*,⁴ which used the *bittern* from the salt works as a raw material, i.e. the liquid left after the removal of salt from sea-water concentrated by evaporation.⁵ From this manufactory the sal ammoniac was retailed at £9. 10s. od. per cwt.

The new information which has been set forth concerning the commercialization of coal distillation and the utilization of the products so produced, throws new light on the economic background of the gas industry which developed in the first two decades of the next century. It also gives us a new perspective of the growth of experimental chemistry during the latter half of the eighteenth century. It is worth bearing in mind that ammonia was only discovered by Joseph Priestley in 1774 and its composition determined by Berthollet in 1785. Thus when Priestley introduced the important technique of collecting gases over mercury, he was exploring the properties of a substance which already had established its commercial utility as a saleable by-product of tar production.

Dundonald spent a lifetime endeavouring to retrieve his family fortunes by application of chemistry to technics. Two circumstances contributed to his failure. He was admittedly unsystematic, which led to his missing chances which others would have seized, and also, in many ways his outlook was too far in advance of the traditions of palaeotechnic civilization. He was one of the first coal owners to cease using female labour,⁶ and had in his genius, according to Dalrymple, a natural lively character and a very good heart. Thus he joins the pioneers led by Dr John Roebuck, whose activities brought great economic power to industrial Britain without fortune to themselves. Britain, rather than Roebuck and Dundonald themselves, reaped the rewards of the abstinence of these men and of their relatives.⁷

¹ *Chemical Catechism* (London, 8th ed. 1818), p. 153.

² George Macintosh, *op. cit.*

³ Sinclair, *General Report*, App. II, p. 310.

⁴ *Ann. Chim. (Phys.)* xx (1797), 186.

⁵ Andrew Ure, *loc. cit.*

⁶ *Description of Culross and its Minerals* (Edinburgh, 1793), p. 66.

⁷ The authors gratefully acknowledge the enthusiastic interest of Professor Lancelot Hogben in the essay; the criticism of Dr Henry Hamilton, Lecturer in Economic History, Aberdeen University; and the financial assistance of the Carnegie and Halley Stewart Trustees.

CANALS BETWEEN THE ENGLISH AND THE BRISTOL CHANNELS

By E. C. R. HADFIELD

IN the eighteenth century coastal shipping provided the only means of internal trade alternative to the roads and navigable rivers: it was natural, therefore, that when canals began to be made, they were planned not only to join two rivers or to supply industrial products to an agricultural district, but to prevent a dangerous coastal voyage. Of the latter, two were outstanding; those round the north of Scotland and round the Land's End. To avoid the first the Caledonian Canal was planned and eventually built, only to be brought into operation as steam was taking the place of sail and so doing away with its necessity. To prevent the second, many plans were made and much money spent. Some dozen canal schemes can be listed which had as their intention the crossing of the peninsula of the south-west, the earliest in 1769,¹ and long after the building of railways, the reduction in the cost of land carriage, and the application of steam to the coastal trade had made the idea economically unsound, optimists still continued to press for a water connexion between the English and Bristol Channels: as late as 1922 echoes of these old schemes can be found.²

It was, however, in the late 1780's that the canal mania spread to Bristol, and to the south-western counties, from the north and east. North, the canals of the midlands, east, the Basingstoke (Act 1778), the Kennet and Avon (*Observations on a Scheme for extending the Navigation of the Rivers Kennett and Avon*, 1788, Act 1794), and the Thames and Severn (Act 1783), led to exaggerated hopes, and to a burst of speculation in the south-west.

Of the many proposals that were put forward three stand out. First, the Dorset and Somerset Canal, which obtained an Act in 1796³ for a canal from the navigable river Stour on the English Channel to Widbrook near Bath on the Kennet and Avon, along which traffic could pass from the south coast to the river Avon, Bristol, and the Somerset and south Wales coasts. The authorized capital was £150,000 with power to raise an additional £75,000, but 'the spirit of speculation was so completely changed by the altered condition of the country, the influence of the French Revolution, the large sums raised by Government on loan, and the high prices which accompanied those events, that not more than £70,000 was subscribed, and out of that sum, only about £58,000 was actually received by the Company'.⁴

The proprietors, however, decided to start work on the branch line from the collieries at Nettle Bridge to Frome, which under their Act they were bound to complete first, reckoning that the funds in hand would be sufficient for this portion of the work. Nearly eight miles were completed, and a balance lock (a variety of canal lift) was built and tried near Frome. About $1\frac{3}{4}$ miles remained to be cut, to connect the existing portions and to complete the branch to Frome in order to carry coal to that town. A little more money had come in, but by 1803 all that was available had been spent, and a debt of £10,000 incurred.

¹ *Harrowby Papers* (Tiverton); *Exeter Flying Post*, 28 Mar. 1793.

² *Canals and Waterways* 7. Jan. 1922, pp. 8-11.

³ 36 Geo. III, cap. 47; J. Priestley, *An Historical Account of the Navigable Rivers, Canals and Railways of Great Britain* (1831), p. 216.

⁴ Pamphlet (undated) *A Proposal*, re this canal, in Great Western Railway collection.

The company therefore obtained a new Act¹ which gave them power to raise money on promissory notes at interest, giving lenders the option of becoming shareholders, and permission to substitute a railroad for a canal on any part of their line. But the proprietors still failed to raise money, and the existing works were abandoned, in spite of an effort at revival during the burst of canal activity round the year 1824.

The second plan was for a canal across Somerset. This originated from a survey made by Whitworth in 1769, when he had recommended a course from Seaton on the English Channel to Langport on the river Parrett, whence barges would reach the sea at Bridgewater, and had estimated a cost of £92,905 for a canal 36 ft. wide at top, as well as £4346 for a harbour at Seaton.² In 1795 a plan was worked out in conjunction with the Bristol and Taunton Company (whom we shall mention in connexion with the third scheme) for reviving this project. The Chard Canal, as it was then called, was to join the Bristol and Taunton near Taunton, and barges from it would run into the Tone, or go via the Bristol and Taunton to Bristol and Bridgewater. The two canals would be of the same dimensions, 30 ft. at top, 5 ft. deep, and would carry boats of 25–30 tons capacity.³

It was calculated that the canal would reduce the price of coal at Chard from £1. 11s. 8d. a ton to 14s. 2d., and £95,000 was subscribed in an hour. It is probable that this scheme would have been proceeded with if it had not been for the progress being made with the third plan.

Whitworth, under Brindley's instructions, had in 1769 surveyed a line from Uphill, near Bristol, via Taunton, to Topsham below Exeter on the river Exe, but it was not till 1 October 1792 that the first meeting was held to consider a proposal to make a canal from Topsham to Taunton, whence barges could navigate the rivers Tone and Parrett to Bridgewater, to be called the Grand Western Canal. The newspaper report states:

Resolved unanimously: . . . That among the advantages that may arise from making this canal, appears to be the easy communication betwixt the Bristol and the British Channel, instead of sailing round the Land's End, which requires various winds, and both in winter and war is a tedious and dangerous navigation. That this canal will afford a safe, easy and expeditious conveyance for coals, lime, timber (and other materials for building), iron, cheese, salt, groceries, hardware, wool, etc. That it is an object of national importance by the ready conveyance of timber to His Majesty's dockyards from the north of Devon, the counties of Somerset, Gloucester, and (particularly the Forest of Dean) Hereford, Worcester, etc. That the general communication between Ireland and Scotland with the western part of England and the Bristol Channel would also be rendered much more easy and safe. . . .⁴

The route was surveyed by a local engineer, revised by Jessop, and was estimated at £166,723. 17s. 9d., of which three collateral branches to Wellington, Tiverton and Cullompton would cost £22,229. 7s.⁵ This amount was subscribed by ninety shareholders.

At the same time, at Bristol, plans were being discussed for a canal from Bristol to Taunton, and agreement was come to between the Bristol and Taunton

¹ 43 Geo. III, cap. 108. 83

² *Somerset Canals*, Goldsmiths' Lib. Univ. of London (collection of reports, etc.).

³ *Somerset Canals*, Goldsmiths' Lib. Univ. of London.

⁴ *Exeter Flying Post*, 4 Oct. 1792.

⁵ W. Harding, *History of Tiverton* (Tiverton, 1845–7), I, 147.

Committee and the Grand Western for mutual co-operation,¹ though later, as we have seen, the former proved equally accommodating to the Chard Canal, being determined to take advantage of any scheme likely to be carried out.

It must be noticed that the Grand Western was projected as a small ship canal on a scale larger than its competitors. Whereas the Chard Canal was to have been 30 ft. at top and 5 ft. deep, the former was 46 ft. at top and 6 ft. 6 in. deep.²

Jessop's revised survey was not satisfactory, and a new one was made by Rennie, who increased Jessop's estimate. In 1796 an Act was obtained,³ giving the company power to raise £220,000 by shares, and another £110,000 if necessary by shares or mortgage. However, the rising costs of the war period and the scarcity of capital caused quietness in all the south-western plans, till the high cost of sea carriage round the Land's End and the losses from French privateers brought about a revival.

In 1808 the plan was reconsidered,⁴ and this activity by the Grand Western caused the Chard Committee also to meet, and to get Rennie to survey their line again, this time for a ship canal.⁵ The engineer estimated that a ship canal could be built for £1,200,000 and £150,000 for a harbour at Beer, to carry vessels of 120 tons (60–80 tons was the Grand Western limit):⁶ he also made an estimate for the Bristol and Taunton Company, again active, of £429,990, and we are told that £571,800 was actually subscribed before the application to Parliament⁷ for the latter canal which resulted in the Act of 1811.

The Grand Western Committee was not deterred by the threatened competition, and after some of the shareholders who had dropped out had been replaced by certain proprietors of the Kennet and Avon Company who agreed to take up the 903 unappropriated £100 shares out of the 2200 available⁸ (which shows that the Grand Western was thought of as part of a through line from London to Exeter as well as a trans-peninsula canal),⁹ in April 1810 cutting was commenced; at the same time the proprietors realized that £220,000 would not be enough to complete the canal at the prevailing prices, and showed themselves prepared to raise an additional £110,000 as they were authorized to do.

It is certain that the Grand Western Committee, in deciding to start cutting, expected the Bristol and Taunton also to begin as soon as they had their Act:¹⁰ at the same time the former did not commence at Taunton, where one would have thought a trade would immediately have arisen via the rivers Parrett and Tone, but at Holcombe Rogus on the summit level. It was decided to cut part of the summit, and also the branch to Tiverton to obtain the limestone trade between these two points. It was then that, on the recommendation of Rennie, the canal's engineer, a disastrous decision was taken to lower the summit level by 16 ft. in order to reduce the number of locks on the main line and to obtain a

¹ *Exeter Flying Post*, 14 Nov. 1793.

² Printed report of 1819 (author's collection).

³ 36 Geo. III, cap. 46. J. Priestley, *op. cit.* p. 344.

⁴ *Exeter Flying Post*, 1 Feb. 1810.

⁵ *Ibid.* 12 Oct. 1809.

⁶ Prospectus of 1824, *Somerset Canals*.

⁷ J. Priestley, *op. cit.* p. 104.

⁸ *Exeter Flying Post*, 1 Mar. 1810.

⁹ *An Authentic Description of the Kennet and Avon Canal*, 1811 (Institution of Civil Engineers' Library). ('It should be observed here, that it is proposed to make the Canal from Bristol to Taunton of the same dimensions as the Kennet and Avon Canal and the Grand Western Canal: so that barges of fifty tons burthen may be laden at Exeter, and proceed to London (a distance upwards of 200 miles) without shifting their cargoes.')

¹⁰ MSS. Report, June 1811 (Great Western Railway).

branch to Tiverton free from locks. It was estimated that 60,000 tons of lime and 30,000 of coal, yielding £10,000 per annum, would be carried annually to Tiverton,¹ and the revenue would help the canal while the rest was being built. However, the deep cutting proved very expensive, the committee incompetent, the officials equally so, and the engineer was shown to have made his survey with insufficient care. Calls were met with reluctance as the proprietors became discouraged, and when in 1815 the 11 miles from Holcombe Rogus to Tiverton were opened it was at a total cost of £244,505,² or more than the sum estimated by Rennie for the whole canal 20 years before, and that for a short length with no locks and one short tunnel. It appears that only 3095 out of the 3300 shares (including the 1100 supplementary ones created in 1810) were issued, and calls of £79 made upon them.³ The canal was built upon the original scale, and no proposal seems to have been made to reduce it.

The proprietors were exhausted by the effort they had made, and for many years this small length of canal, unconnected with any other navigation, built on a large scale, remained in the centre of Devonshire. The £10,000 a year income did not appear. It was found uneconomic to carry coal, and the traffic was the westward one of limestone to Tiverton, with practically no eastwards haul.

The tolls received were:

	£	s.	d.		£	s.	d.
1816	574	6	3	1827	739	0	7
1817	Unknown			1828	623	15	2
1818	556	13	7	1829	705	2	8
1819	627	5	2	1830	Unknown		
1820	752	10	7	1831	756	19	11
1821	632	1	1	1832	918	1	8
1822	Unknown			1833	839	18	10
1823	401	16	7	1834	968	9	2
1824	381	1	5	1835	970	11	0
1825	573	3	1	1836	1164	0	0 ⁴
1826	700	19	8				

No dividends were, of course paid.

In the twenties important developments took place. James Green, an engineer of Exeter who gained some reputation with canals, was instructed, perhaps by the old Chard Committee, to survey that route for a barge canal,⁵ while the Bristol and Taunton project (which had never been begun, probably because the proprietors saw what was happening to the Grand Western) was revived in a reduced form as the Bridgewater and Taunton, its object being to avoid the difficult navigation of the Tone and Parrett. Green presented his report on December 1822, in favour of a small canal from the Bridgewater and Taunton near the latter town, to Beer, near Seaton. The canal was to be mostly 22 ft. 6 in. at top and 3 ft. 6 in. deep, and the total cost was estimated at £123,156. A meeting was held, and a decision taken to apply for an Act, but over the next 18 months the scheme evolved into a much bigger one for an English and Bristol Channels Ship Canal.

This was surveyed by Telford, assisted by Green, on a line west of Rennie's old 1809 route, and the engineers proposed a ship canal to take vessels of 200 tons

¹ Printed Report, 15 Aug. 1811 (author's collection).

² Account put in evidence, 1864 (author's collection).

³ Counsel's brief, 1864 (author's collection).

⁴ Counsel's brief, 1864.

⁵ *Somerset Canals*, Green's report of 1822.

fully loaded, requiring 15 ft. depth of water. There were to be thirty locks, and the canal would have a width of 95 ft. at top. Its total length would be 44 miles 5 furlongs, with harbours at Beer and Stolford, on the Bristol Channel. The cost was estimated at £1,712,844. Captain Nicholls, who estimated the traffic, considered that vessels would save a week's sail on each passage, and that 5088 vessels passed the Land's End in 1823 which might be expected to use the canal. It was calculated that 1,095,527 tons would pass through the canal each year from coast to coast, bringing in a revenue, with harbour dues, of £210,846. 12s. 4d., while the maintenance cost of £22,000 a year would be met from the internal trade without calling on the receipts from the through traffic, which would be available for the shareholders.¹

An Act was passed in 1825,² giving the company a capital of £1,750,000. The Parliamentary Committee on the Bill had been critical, however, and the project was considered speculative in the extreme. £1,518,000 was subscribed,³ but 1824 was a boom year, and a meeting of the company held on 23 June 1828 reported: 'The severe shock... which was given to public confidence shortly after the passing of the Act, and the consequent aversion to almost every speculative undertaking, have not failed to affect the Ship Canal, so as to render it highly improbable that so large a capital as £1,750,000 will now be raised for the accomplishment of this object.'⁴

That meeting produced a revised scheme for a smaller canal to cost £600,000, but nothing was done, though echoes of the 1825 plan come to us for a hundred years afterwards.

Meanwhile the Bridgewater and Taunton Company proceeded to build its limited line, which was completed at a cost of £71,200, with a length of 14 miles.⁵

During the time the Ship Canal was being advocated the advantages which connexion with it, by means of the Bridgewater and Taunton, would give the Grand Western were clearly enough seen, and considerable speculation in its shares (£100, £79 paid up) took place, the value rising from an average of £3 in 1822 to £17 in October 1824.⁶

In 1829 James Green proposed that the canal should be continued to Taunton, the Bridgewater and Taunton now being completed, on a much reduced scale of 23 ft. top and 3 ft. depth,⁷ and the next year reported that the extension could be built for £61,324. 6s. 7d., seven canal lifts and one inclined plane being required.⁸ The Report was approved, and a Special Assembly decided to proceed, the expenditure not to exceed £65,000.⁹

Difficulties were many. Old shares forfeited in 1810-15 for non-payment of calls were impossible to sell, and were distributed among the shareholders. The lifts, an invention of Green's, had to be altered (at the engineer's expense) before they would work, and by 1836 the situation was serious. The extension was not open, and funds were exhausted.¹⁰ Between that date and 1838, when the canal was opened to Taunton, money was scraped together from any available source, including the committee and the superintendent, who lent £1400.¹¹ About £10,000 was borrowed in addition to the £65,000 raised from the shareholders.

¹ Prospectus of the English and Bristol Channels Ship Canal, *Somerset Canals*.

² 6 Geo. IV, cap. 199. J. Priestley, *op. cit.* p. 264.

³ Deed of Association, Goldsmiths' Lib.

⁴ *Somerset Canals*. ⁵ 5 Geo. IV, cap. 120.

⁶ Share transfer book.

⁷ Printed Report, 28 Apr. 1829 (Great Western Railway).

⁸ Printed Summons to Meeting, 18 Mar. 1830 (author's collection).

⁹ Printed Report (Great Western Railway). ¹⁰ *Ibid.*

¹¹ MS. accounts.

At last the line was open from Tiverton to Taunton, and barges could pass from the former to the Bristol Channel for the transshipment of their goods, and bring coal from south Wales. The idea of connecting the Channels had given way to the more limited object of supplying the country between Taunton and Tiverton, but, left to itself, the canal might at last have proved something of an investment to its long-suffering proprietors. The tolls received were as follows:

	£	s.	d.	
1836	1163	19	11	
1837	1822	19	9	
1838	2754	4	0	
1839	Unknown			
1840	3456	19	3	These figures include tonnage from railway building material ¹
1841	3631	19	7	
1842	4114	15	1	
1843	4768	15	11	
1844	4925	10	8	

The railway age came slowly to the west country. In the thirties the Grand Western Canal extension was being built, and a different Chard Canal, a branch from the Bridgewater and Taunton, was also being constructed under an Act of 1834-5.² In 1837, however, an Act was passed for making the Bristol and Exeter Railway with a branch to Tiverton, and by 1844 the main line had been opened.³ At once a decline showed itself in the canal receipts, and after 12 June 1848, when the Tiverton branch was opened, the fall was catastrophic:

	£	s.	d.		£	s.	d.
1845	2819	6	6	1850	1660	8	3
1846	2302	12	1	1851	890	5	2
1847	2291	15	11	1852	974	19	11
1848	1735	8	6	1853	734	9	10
1849	2351	18	4	1854	956	1	11

Tonnage carried (tons and cwt.)

	Through haul Taunton-Tiverton		Summit level Holcombe-Tiverton		Total	
	tons	cwt.	tons	cwt.	tons	cwt.
1846	12,088	13	22,220	10	50,326	8
1847	10,532	7	26,922	15	56,511	15
1848	2,456	5	19,900	10	37,417	10
1849	2,107	0	13,335	5	29,776	3
1850	1,961	0	14,628	17	30,047	7
1851	2,282	0	15,411	0	33,551	15
1852	4,373	14	16,648	0	37,354	3
1853	1,579	0	19,257	5	35,753	15 ⁴

(The difference between the third column and the first two combined is due to the omission of intermediate hauls.)

From 1845 onwards the canal company found it impossible to pay its mortgage interest, and for the last four years of the above period it had to resort to further loans. The canal and the railway proceeded to cut rates against each other, the former about 1851 charging for coal from Taunton to Tiverton at $\frac{1}{4}d$.

¹ Counsel's brief, 1864.

² W. Phelps, *History of Somersetshire* (1836), I, 57.

³ E. T. MacDermot, *History of the Great Western Railway* (1931), *passim*.

⁴ Account put in evidence, 1864.

per ton per mile to enable the canal traders to sell at Tiverton at the same price as the railway company delivered, and later they carried coal free of any toll whatever. At the same time the railway was itself losing money as a result of this competition, which can have been appreciated only by the coal traders and consumers at Tiverton. The railway, being able to recoup itself elsewhere, was in the stronger position, and bided its time.¹

The extent of the price cutting can be seen by comparing the figures for tolls and tonnage in the years 1849 and 1853. In each year the canal carried 37,000 tons, but whereas it received £2351 in tolls in 1849, this had fallen to £734 in 1853. The canal company did, however, succeed in raising the tonnage carried from Taunton to Tiverton from 1961 in 1850 and 2282 in 1851 to 4373 in 1852.

In 1853 the Grand Western Committee learned to its horror that the Bridgewater and Taunton Company had opened a negotiation with the Bristol and Exeter Railway for the sale or lease of their property. The committee saw at once that if the railway controlled the sister canal they could close it, or raise the tolls to a prohibitive level, and so cut off from the Grand Western all the through traffic from Bridgewater and the Bristol Channel, except such as might be worked through the almost unused Tone and Parrett rivers.

Counsel's brief in 1864 expresses the position succinctly:

In this difficulty it was determined to open a negotiation with the railway company for the sale or lease to them of the whole of the Grand Western Canal inasmuch as to keep the latter open any longer in competition with the railway company was simply impossible and the current expenses were not and could not be met from the revenue under such circumstances whilst in the hands of the railway company the canal would at once and directly to some extent be made a source of revenue by retaining on it the lime and other stone traffic from Holcombe Rogus to Tiverton and indirectly to a much greater extent on being virtually closed against the long or through traffic of coal, etc., from Bridgewater and Taunton to Tiverton by the imposition of the full Parliamentary rates of toll thus enabling the railway company to raise their charges for the carriage of this coal etc., to Tiverton to a remunerative rate.

It was estimated that the railway was losing £6000 a year by the competition, and for that reason both parties were anxious to come to terms as quickly as possible.

Within two months of the action of the Bridgewater and Taunton Company, the Secretary of the Grand Western had made an arrangement with the railway. The latter not being disposed to buy the canal outright an agreement was made whereby the Bristol and Exeter Railway should lease the canal for £2000 a year, the canal company keeping it in repair. One of the items of the agreement was that the tolls (except those on stone which did not compete with the railway traffic) should be raised to the maximum Parliamentary rate as from 11 October 1853, the same date as that on which the Bridgewater and Taunton and the railway's own rates were also to be raised.

The secretary then agreed himself to keep the canal in repair for £600 a year and the use of the boats to make what he could, and the canal company found itself with £1400 a year in hand. The mortgage holders, who had advanced money to complete the canal, agreed to reduce the interest on their debt from 5 to 3%, and to cancel arrears of interest, and at last the canal paid a dividend, of 4s. per £100 share per annum. The railway sublet the canal back to the superintendent, at a nominal rental that was at one time reduced to £80 per

¹ Counsel's brief, 1864, is the evidence for this and all following information.

annum,¹ with permission apparently to charge less than the highest toll so long as he did not compete with the railway, for it was in 1864 rather heatedly stated by Counsel:

... the navigation has ever since (1853) been open for any trade that might be brought to it and it is not open to anyone to say that any traffic has been refused to be admitted to or passed over the Canal or any part of it, or that obstacles have been opposed to such traffic being conducted on it subject to the payment of the rates of tonnage from time to time fixed and levied in respect of such traffic on the Canal, these rates having always been considerably under the highest authorised to be taken by the Canal Company's Acts.

In the next few years the canal company several times suggested that the railway should buy the canal, but the former rather ironically replied that the Board of Trade and Parliamentary Committees were not always in favour of the abolition of competition between rival carrying companies. Meanwhile traders went over to the railway and the machinery of the lifts and the inclined plane became rusted and older still. That the railway was killing time is made likely by the fact that whereas in the first draft of the agreement of 1853 a price range of £35,000-45,000 was inserted for the guidance of arbitrators if the railway decided to buy the canal under the option contained in that agreement, the final figure of 1864 was £30,000. (The figures were omitted from the final agreement of 1853.)

At last, in 1863, the railway agreed to buy and pay for the Act, on condition that Parliament agreed to the Holcombe-Taunton section being closed and demolished. A petition was put in against the purchase Bill, signed by ten local landowners, though one later withdrew. The principal points were that the canal would pay its way if left to itself and freed from the railway company, that it was still required for local trade that could not be carried by the railway, and that various people had built warehouses and mills on its banks which would now be rendered useless, unless compensation were paid. The railway in reply produced figures to show that the Holcombe Rogus-Taunton traffic had been carried at a loss since 1846, and pointed out that entrepreneurs who had put up buildings at their own risk could not properly expect compensation.

The explanation of the economic defeat of the canal given by Counsel for the Bill while attacking the petition is worth quoting:

Clause 2 of the Petition. That the said Railway Company now are and have been for many years past the Lessees of the said Canal at a yearly rent and by reason of their said occupation the trade and traffic which prior thereto belonged to the said Canal have been diverted therefrom by the said Railway which (together with the said Canal) runs amongst other places from Taunton aforesaid to Tiverton.

Counsel for the Bill. The statement (2) that the Railway Company have some years (since 1853) been the lessees and occupiers of the Canal at a yearly rent is admitted but not the inference sought to be drawn from it that by reason of their said occupation the trade and traffic which belonged to the Canal had been diverted to the Railway. No trade or traffic ever 'belonged' to the Canal in the sense here used; whilst it was cheaper to carry certain goods over the Canal than over the Railway they were so carried but this has not been the case since the complete opening of the Railway to Tiverton and the traffic therefore fell to the Railway Company by natural laws as the traders left the Canal Wharfs and opened fresh yards in connection with the Railway at Tiverton. Nothing could retain the traffic on the Canal and the rent of £2000 per annum is partly paid (1/3) for the stone and lime traffic still continued on the upper level of the

¹ *Great Western Railway Magazine* (1914), article, 'Grand Western Canal'.

Canal and as to the remainder in consideration of the abandonment by the Canal Company of the system of competition carried on in 1852-3 by the latter under which coal, etc., was carried to Tiverton free of all toll in order to bring the Railway Company to some terms of compromise. This ruinous system could not of course be carried on for any length of time by a Company having no other resource and the Canal Company was in a measure compelled to come to this agreement without which they would have been without funds for the maintenance and repairs of the works.

With this one might compare question 23,687 put to Mr T. H. Rendell, Goods Manager of the Great Western Railway, giving evidence before the Royal Commission on Canals and Waterways in 1907-9:

Q. Do you wish to refer to the statement which has frequently been made that railway companies bought up canals in order to strangle them?

A. I think the statements that have been made show this was not the case—that the canal companies were anxious to dispose of themselves to railways....

So the canal was sold.¹ £14,750 was used to pay off the mortgages, £3250 went in compensation and miscellaneous expenses, leaving £12,000 for distribution among the shareholders; or £4 per share on the 3000 shares whose owners could be traced. The lower levels were demolished, and the ironwork removed from the lifts and plane: the upper level was kept in use for carrying stone, on a scale that dwindled until the cost of upkeep exceeded the revenue. With the coming of the motor lorry, even this trade left the canal, and the short stretch of 11 miles of waterway that remains to-day, the sole visible result, except for some traces near Frome, of the many efforts to cut a navigable canal across the peninsula of the south-west of England, lies useless and partly derelict.

Meanwhile, the Bridgewater and Taunton Canal had been sold to the same purchasers in 1866, for £64,000, subject to the canal being kept open, and the Chard Canal was then bought for £6000 and closed under powers obtained in 1867.²

¹ 27 and 28 Vict. cap. 184.

² E. T. MacDermot, *History of the Great Western Railway*, *passim*.

MEMBERS OF PARLIAMENT AND THE PROCEEDINGS UPON ENCLOSURE BILLS¹

By W. E. TATE

I

MANY historians have criticized very strongly the enclosures by private act in the eighteenth and nineteenth centuries. It is often suggested that little but injustice could be expected of legislation passed in an age when Commons and Lords alike were dominated by the landed interest. The implication is that in neither House was there, nor could there have been, any strong opposition to measures designed to benefit members of the landowner class, even if this benefit could be obtained only at the cost of ruining vast numbers of persons who were so unfortunate as to be placed lower in the social scale.

Of the modern writers who have castigated the eighteenth-century parliamentarians, probably the best known are Professors Hasbach² and Mantoux,³ and Dr and Mrs J. L. Hammond.⁴ The first-named tells us, for example, that 'the motives which led to enclosure were not pure... the standard of comfort had risen considerably among the rich landowning classes... The landlord found it necessary to appropriate the commons... if he were to keep up, or perhaps to improve his position in society.' When, as a result of these motives, after a series of highly discreditable preliminary manœuvres, an enclosure bill at last appeared before the House of Commons 'no member not directly interested would take any notice of the Bill in its passage through the House... the Bill would go through its stages practically unregarded'. Professor Mantoux is equally sure that the Parliamentary proceedings were a mere mockery. 'The heads of the ancient nobility, (*sic*) in the House of Lords, as also the many country squires in the House of Commons, were representatives of the great landed interests.' Dr and Mrs Hammond go into more detail, and give numerous instances supporting the same view.⁵ They speak of the commoners' only appeal being to a 'dim and distant Parliament of great landlords', of Parliament 'instructing the member who presented the petition to prepare the bill'; of the committal of the bill 'to the member charged with its management, and such other members as he may choose to name in the House, and the members serving for a particular county and the adjoining counties'⁶ (their italics), so that 'members to whom bills have been committed have been generally those who have been most interested in the result'. They go on to describe the practice of 'opening the Committees', and suggest that while this may have secured rough justice as between powerful interests represented in Parliament, it left the (unrepresented) small proprietors absolutely at the mercy of these conflicting forces. They follow this account with instances of unjust clauses in enclosure acts,

¹ The data referred to below are set forth at length in the author's *Nottinghamshire Parliamentary Enclosures*, 'Thoroton Society Record Series' (1935), vol. v, pp. xxv + 215.

² *The English Agricultural Labourer* (Eng. Trans. 1908), pp. 61-3.

³ *The Industrial Revolution* (Eng. Trans. 1931), p. 171.

⁴ *The Village Labourer* (1912), pp. 45-7.

⁵ *Op. cit.* p. 20.

⁶ This is, of course, a quotation from the *Report* of the Committee of 1825.

which they say could never have passed through a House fairly constituted or through truly representative committees, and they contrast the treatment meted out in committee to counter-petitions submitted by influential persons with that accorded to similar counter-petitions submitted by the poor and friendless.

Most of these charges fall under two heads: (a) that the average eighteenth-century member of Parliament was profoundly uninterested in enclosure bills touching lands in someone else's constituency; and (b) that when his own estate was in question, or when a bill affected the property of his family or friends, he was actively concerned in its passage in order to ensure for himself or his friends as large a share as possible of the spoil.¹

The former charge, for what it is worth, is upheld by such evidence as has been examined for the purposes of this essay. A contemporary treatise advises intending enclosers how to set about their work:²

Procure the attendance of as many members as you can in every stage of the bill. . . . It will be proper to obtain from the clerk who is to attend the committee a copy (*sic*) of the members who are to compose the committee, and then to apply to some of the members named therein to attend the committee. . . . To compose the committee there should regularly be eight; though where there is no opposition to the bill this rule is not strictly adhered to. . . . The report being prepared and finished, the chairman of the committee should be requested to come down to the House to report the bill, and if it be inconvenient for him to attend he will depute some other member to report it for him. . . . (The member carrying the bill to the Lords) is attended by seven others. All the members therefore with whom the parties have any interest should be requested to attend the third reading. . . . There must be five lords to form a Committee, and unless you request two or three peers to attend it is not easy to make a committee.

The reason for this attitude was that enclosure bills were almost invariably 'private' bills,³ and as such were regarded, like other private bills such as those for divorce, estate settlement, disentailing, etc., as essentially the concern of individuals.⁴

The second and far more serious charge seems essentially a matter for statistical investigation. It is the object of this essay to provide statistical evidence for one geographical area. Details of all the members concerned in the preparation and reporting of all the enclosure bills passed for Nottinghamshire, 1743-1845, have been extracted from the *Commons' Journals*. Altogether there were 171 such bills petitioned for, and of these 133 reached the statute book. There seems every reason to believe that in its agrarian history Nottinghamshire is typical of the former open-field area generally.⁵ Its parliamentary history too

¹ 'One of the group of comrades who sauntered down from Almack's of an afternoon to carve up a manor in Committee of the House of Commons. We can see Bully's [Lord Bolingbroke's] friends sitting round the table in their solemn character of judges and legislators to give a score of villages to Bully and a dozen to Stavordale, much as Artaxerxes gave Magnesia to Themistocles for his bread, Myus for his meat, and Lampsacus for his wine.'

² J. B. Bird, *Law of Commons and Commoners* (2nd ed. 1806), pp. 93, 95, 97, 99.

³ This is so generally true that Dr and Mrs Hammond and the legal authorities Lord Justice Scrutton and K. E. Digby use 'private bill procedure' and 'enclosure bill procedure' almost as synonyms.

⁴ Mr E. J. Jones, in one of the best of the few county studies of the enclosure movement, notes: 'Even the bill itself was frequently prepared by the member of the House who had presented the petition.' 'The Enclosure Movement in Anglesey', *Trans. Anglesey Antiq. Soc. and Field Club* (Llangefni, 1925), p. 52.

⁵ H. L. Gray, *English Field Systems* (Cambridge, Mass. 1915), frontispiece; and G. Slater, *The English Peasantry and the Enclosures of Common Fields*, 1907, Plate 1.

seems quite normal. The shire had, of course, its two county members (often the seats were amicably partitioned, one being held by a Whig, another by a Tory); one fairly democratic urban constituency with a rather wide franchise in Nottingham town; a Newcastle 'pocket' borough in Newark-on-Trent; and a particularly notorious and corrupt rotten borough in East Retford.¹ One would guess then that the eighteenth-century Nottinghamshire parliamentarians were not above the general average.

The 171 Nottinghamshire enclosure bills were presented or reported or both by 116 different members. These bills, as noted above, resulted in the passing of but 133 separate acts, i.e. thirty-eight of them were abortive. Since usually two members were ordered to 'prepare and bring in' the bill, while one only, the chairman of the committee, is noted in the *Journals* as reporting it, and since an abortive bill normally dropped after presentation and report, the 116² members might have acted in connexion with the bills about 475 times, and the average member presenting or reporting bills might have been concerned in the proceedings on about four occasions. If he presented *and* reported the same bills he would have been involved in the proceedings upon two bills. However, it would be entirely incorrect to suppose from this that the typical eighteenth-century member stayed away from the House upon every occasion throughout his parliamentary career when enclosure bills were being dealt with except twice or three or four times when his own property was involved (and then duly arrived in order to look after his own interests). Let us examine the facts.

II

In the passing of the 133 acts and the proceedings upon the thirty-eight abortive bills there were altogether 513 'occasions' upon which members took part in the proceedings. The difference between this and the 475 noted above is accounted for by some bills being recommitted for amendments (and therefore being reported twice), by very occasional bills dropped after they had reached the report stage and not before, and by a few bills being prepared by three or even four members instead of the usual two.

Let us first consider the occasions on which the members concerned in the proceedings appear to have been rightly chosen and to have performed their duties properly and without regard to their private interests. These members fall into two main categories: local members, and ministerial office holders with no personal connexions with Nottinghamshire.

On 293 occasions³ (57% of the whole), the members taking part in these

¹ T. H. B. Oldfield, *History of Parliament* (1797), admits the 'independence' of Nottingham town, but adds: 'The corporation contrive to procure the return of one or both members.' He alleges that the county in his time was influenced to the extent of one seat by the Bentincks, one by the Pierreponts. Newark was quite notoriously a Newcastle pocket borough, and East Retford, though a rotten borough, was largely under Newcastle influence.

² This reckoning includes the half-dozen ministerial office holders (noted below, p. 73), who were all non-local men. Excluding these the total is 110.

³ This is a net total. I have excluded every occasion where a member's family is known to have had any interest (save the ownership of the advowson alone) in a parish. These special cases are dealt with below. By so doing I have again erred on the side of injustice toward the members, e.g. in reducing the Pierrepont 'occasions' from 123 to 114. It is clear enough that the Pierrepont interest in the movement was an official rather than a personal one, and that the county member acting in 114 enclosures where his family's interests were not affected, was not necessarily a rascal because he concerned himself also on nine occasions when they were. The gross total amounts to 318—62%.

proceedings were the county members; an Eyre, a Pierrepont, a Rolleston, a Sotheran, a Thornhagh, a Willoughby, and a couple each of Cavendish-Bentincks and Pelham-Clintons, in their capacity as county members. No doubt among the proceedings which they attended there were some in which family estates were involved, but they must be a very small minority.¹ Even the Bentincks do not own a seventh of the old parishes of Nottinghamshire. Certainly the Eyres have never owned an eighteenth, or the Pierreponts a quarter, and these are the proportions in which they took part in Nottinghamshire enclosures. Where definite evidence exists that a county member took part in an enclosure of a parish where the family had interests, small or great, he has been excluded from the above reckoning, and counted separately among 'members of local families'.

The members for the three Nottinghamshire boroughs, Nottingham, East Retford and Newark-on-Trent, were involved in the enclosure movement on forty-five occasions (19% of the total). Most of these men seem to have been concerned in bills dealing with lands in or near their boroughs. When there was a family connexion between member and borough this may mean sometimes 'on or near their own estates'. There seems little evidence of this, however, and full weight has been given here to what little evidence there is. Taking the men in order of their boroughs: Daniel Parker Coke and John Plumptree were Nottingham members and their bills deal with lands many miles from any place where their families had properties. Perhaps these men acted *vice* the county

¹ Among these men there appears the Earl of Lincoln who figures very prominently in the text books as an opponent of enclosures (Hammond, *op. cit.* p. 53). Included among them also is Thomas Willoughby who, though he was a county member, was concerned in the enclosures of three places where he may have had interests, though small ones. It is possible that he had a small estate in Normanton-on-Soar, 1770, and in Laneham, 1772. Certainly he had a modest property in Bramcote, enclosed under the Stapleford act of 1771. However, all these estates are either small or doubtful. General William Howe, member for Nottingham, 1758-80, is omitted solely because in the Hickling bill of 1775 he was associated with another Howe. Neither was concerned elsewhere in the Nottinghamshire enclosure movement, which is strong presumptive evidence of a family interest in the place. It is possible that one Nottingham member, Sir Willoughby Aston, concerned in but one enclosure, was related to the petitioner, Lord Middleton (a *Willoughby*), at the place concerned, West Leake. If so, it is no doubt significant also that the bill was reported in the Lords by Lord *Willoughby* of Parham. Daniel Parker Coke was concerned in eight bills. He had sat for Derby 1775, for Nottingham not until 1780. If his Derby seat was obtained under the patronage of the Cavendishes (one *Derbyshire* seat was normally theirs) it may be significant that he acted for Clarbrough Moorgate, 1799, where the Cavendishes held the impropriation. The Retford member most often concerned was Sir Cecil Wray, who acted on four occasions. Retford was largely under Newcastle influence. Wray acted for North Muskham, etc., 1771, where the Duke of Newcastle was the petitioner, and for Kersall, 1778, where the Duke was lord of the manor, so no doubt was the chief petitioner, though he is not named as such in the *Journals*. General Henry Clinton was a Newark member who acted on but one occasion. He sat for Boroughbridge, another Newcastle borough from 1774, and for Launceston in and after 1790. The only bill in which he was concerned, Basford, 1774, was for a place where the Duke was lord of the manor and principal owner. The Rt. Hon. John Shelley, another Newark member, was also concerned in but one bill. It relates to Cromwell, which is very near Newark. No doubt many of his constituents were interested in the place. Thomas Thoroton, another Newark member, was concerned in two bills while he sat for Boroughbridge, Yorks; for Barton and for Misson, both 1769. He lived near Newark, but these places are in opposite corners of the county. Neither Thoroton nor (his patron?) the Duke of Newcastle appears to have had any interest in either place. Mark Wood was another Newark member concerned in one bill only, that for Newark itself, 1800. It was dealt with while he was member for the borough.

members who were otherwise engaged. Sir Wharton Amcotts was member for East Retford, and his solitary bill is for a parish bordering the ancient borough, and now included within the boundaries of the modern one. Sir Cecil Wray was another East Retford member, and the only bill which he both presented and reported relates to another similar parish, while his other two are not far away. Job Staunton Charlton was member for Newark. In none of the parishes concerned did the Charltons own an acre of property. There are some instances to the contrary, and these five occasions (1 %) will be treated separately; but, on at least forty out of the forty-five, members cannot be shown to have acted in any way contrary to the parliamentary standards of the present day. These forty (8 %) may therefore be added to the occasions on which, as we have seen, the county members acted in regular discharge of their duties. This gives a preliminary total of 333 occasions (65 %) to which the charges of improper dealings cannot be shown to apply.

To these may be added a number of occasions when the members taking part sat for the four neighbouring counties of Derby, Lincoln, Leicester and York, or for boroughs within these counties, so can also be counted as local members.¹

¹ According to Oldfield, Derby county was influenced by the Cavendishes as to one seat, the other was usually a Tory possession. Lincolnshire was necessarily represented 'by the two wealthiest gentlemen of the county'. Lincoln city had no patron. Boston was controlled by the Duke of Ancaster and Thomas Fydel; Grantham by the Duke of Rutland, and Lord Brownlow; Stamford by the Earl of Exeter; Leicestershire by the Duke of Rutland and Lord Curzon. Leicester borough had no patron, nor, of course, had Yorkshire. Taking the members for these various counties and boroughs who were most often concerned: Edward Miller Mundy, a Derby county member, was concerned in two Nottinghamshire enclosures, those of East Leake, 1786, and Walkeringham, 1802. Neither place is particularly near the Nottinghamshire-Derbyshire boundary. Robert Vyner was a member for Lincoln city who acted on two occasions only. On both these the enclosure was of a parish straddling the county boundary, with the main part in Lincolnshire. John Fenton Cawthorne was a Lincoln city member, concerned on but one occasion. The place concerned was not far from the county boundary. Richard Ellison was another Lincoln city member concerned once only. The place affected was Newark which is almost on the Lincolnshire boundary. George Sutton is reckoned among the 'suspicious' cases. He was member for the Manners borough of Grantham. He was associated with another local man, William Pochin, who sat for the Manners county of Leicester. Earlier he had sat for Newark where the Manners had influence, and later he sat for another Manners borough, that of Bramber, Sussex. The only bill in which he was concerned was that for Granby and Sutton, where the Duke of Rutland, though not named in the *Journals*, is known to have been interested, as lord of the manor, patron, and impropiator. One of the commissioners named in the bill was probably the Duke's steward. George Bridges Brudenell, member for Stamford, Lincs., was concerned in the proceedings upon but one Nottinghamshire bill. This concerned a place on the Nottinghamshire-Leicestershire-Lincolnshire border. William Pochin is another man concerning whom there is reasonable ground for suspicion. He was member for the Manners county of Leicester, and is the man noted above as associated with George Sutton, member for the Manners borough of Grantham. He was concerned in two enclosures in Nottinghamshire, and in at least one of these the Duke of Rutland was the landowner chiefly concerned. The Yorkshire borough members sat for places like Hedon, Malton, Scarborough, and Thirsk, many miles away from Nottinghamshire. They are therefore dealt with elsewhere, as are the Lincolnshire members, e.g. Grimsby. The Yorkshire county member chiefly concerned, apart from Sir George Savile, referred to elsewhere, was Henry Lascelles, member 1796-1812, with an interval during which he sat for Westbury, Wilts. Three of the five occasions relate to places very near the Yorkshire-Nottinghamshire boundary. He appears to have had no connexion with the remaining two places, East Leake, 1798, and Bulwell, 1799. Another Lascelles, Daniel, member for Northallerton, is counted elsewhere among the members having no evident

County members taking part in the enclosure of parishes where they held no land, particularly if the parishes were on or near the borders of the county for which they sat, and borough members concerned in the enclosure of lands in Nottinghamshire only a few miles from their own boroughs (though the county boundary ran between), are included in this category; members concerned in the enclosure of parishes remote from their constituencies and in which they had private estates are excluded. An instance or two will make the method clear. Lord George Cavendish, member for (Weymouth and) Derbyshire, 1751-90, is not included, since he was concerned only in the enclosure of Clarborough, a parish 12 miles at least from the Derbyshire boundary, and one where the Cavendishes owned the great tithe. Nor is William Mellish, member for Grimsby (and Middlesex), 1796-1818, since, first, Grimsby is on the side of Lincolnshire remote from Nottinghamshire, and secondly, it is known that the Mellishes had estates in both the parishes concerned. Sir Thomas Palmer, member for Leicestershire, 1754-61, is, however, included, since the only Nottinghamshire parish in whose enclosure he was concerned, Upper Broughton, lies on the border of Leicestershire. Actually Upper Broughton is in Nottinghamshire, not Broughton in Leicestershire. Apparently he was a landowner in neither place.

Nearly all these men were concerned in enclosures on the side of Nottinghamshire nearest to their own counties. Let us consider, for example, the Yorkshire members. The only ones taking part in the proceedings upon more than at the most one or two bills were a Lascelles and a Savile. Three of Lascelles's five occasions were in connexion with bills relating to parishes in the extreme north of the county, nearest Yorkshire. Savile was the only Yorkshire member to be concerned in a fair number of Nottinghamshire bills. He belonged to one of the great Nottinghamshire families, but there is no trace of substantial Savile property in any of the parishes concerned. One of the enclosures in which he was concerned actually straddled the county boundary and included two Yorkshire townships as well as a single Nottinghamshire one. Even Dr and Mrs Hammond do not question his honesty and disinterestedness. Similarly, the Lincolnshire member who acted most frequently was a Robert Vyner, whose two occasions both relate to an enclosure straddling the Nottinghamshire-Lincolnshire boundary. On some seven occasions only—1%—there seems evidence that the member, his relatives or his patron may have been interested in the lands concerned. In the absence of evidence to the contrary we may suppose that these members acted either as the representatives of neighbouring counties and boroughs, or were perhaps nominated to deal with local bills when the Nottinghamshire men, eight in all, were absent or otherwise engaged. Twenty-six occasions (5%) can therefore be added to the existing totals, making 359 occasions (70%) where the choice of members, and their performance of their duties, seem to have been quite correct.

To these may be added half a dozen further instances, of men who took part in the enclosures of Blidworth, 1769, and Edwinstowe, 1818. In both these places substantial areas of the former forest of Sherwood were involved, and (perhaps for this reason) the government seems to have nominated ministerial office holders to associate with the county members dealing with the bills. These men all sat for non-local constituencies. Each acted on one occasion only, connexion with the county. Several of the places whose bills he dealt with adjoin parishes whose bills were dealt with by this Henry—a fact which may possibly indicate some family connexion. Sir John Johnston is reckoned as a Yorkshire county member, though he actually sat for Scarborough when he was concerned in Nottinghamshire enclosures, on one occasion only. The place is Nottingham itself, with which he had no obvious connexion.

making six in all (1 % of the total). None of these men appears to have had any local connexion, or any property in the county. If these six occasions are added to the 359 already arrived at, we obtain a total of 365 occasions (71 % of the grand total). In almost three-fourths, then, of the total number of occasions there seems no reason to suppose that injustice was done on account of the private self-interest of the members concerned, except in so far as injustice must necessarily occur to some extent when, in a class society, members of one class legislate concerning the livelihoods and properties of those occupying a very different position in the social order.

III

Let us now consider the instances in which it is possible that the actions of the members concerned were guided by consideration for their own economic interests. These instances comprise the occasions on which members with territorial or family connexions in the county, whether sitting for Nottinghamshire seats or for those elsewhere, took part in proceedings on Nottinghamshire bills. If the places affected can be shown to have included properties of their own or of their friends, associates, or relatives, these are the occasions upon which there might have been opportunity for members to line their own pockets if they were intent upon doing so. Clearly a statement of this sort, listing *opportunities* for rascality rather than *evidence* of it, will tend to exaggerate the amount of shady work that took place, but this may be in part offset by the inclusion (for lack of knowledge) of other members connected by ties of marriage, relationship or friendship with the promoters of enclosures in a particular parish, in the category of members 'having no ascertainable connexions with the county'. Members of local landed families were concerned altogether on sixty-one occasions (12 % of the total). In only a proportion of these instances is there any ground for suspicion that members of parliament in the eighteenth century actually abused their position in the way suggested. No estimate can be attempted of the number of occasions on which such abuse took place, but it is possible to work out approximately the number of occasions on which there was at any rate some opportunity for it if the members were so disposed. This amounts to forty-six occasions, some 9 % of the total. As to the remaining fifteen occasions (3 % of the total) there is no ground even for suspicion.

It is interesting to note that one or two of the occasions reckoned under the first head seem even more gross than the instances elaborated by Dr and Mrs Hammond. The Sedgmoor bill of 1775, for example, which the Hammonds criticize very severely, and with a wealth of detail not available concerning any Nottinghamshire enclosure, was unsuccessful, and was presented by the brother of the principal petitioner. Some of the instances reckoned above relate to successful bills, and several of these were either presented or reported by the petitioners (sometimes the sole petitioners) themselves. Making full allowance for these, however, we can still increase our 365 occasions (71 %) by fifteen occasions (3 %) to 380 occasions (74 %), where there is no ground for suspicion that members were actuated by self-interest. But we have gathered forty-six occasions (9 %) where there seems to be a case for further inquiry. Added to the similar instances already noted, they give us a total of fifty-eight occasions (16 % of 380) which are worthy of further investigation. These members are not necessarily guilty, but time, motive and opportunity are proved against them, and there is against some of them at any rate a *prima facie* case. So out of 513 occasions (100 %) the members are fairly certainly innocent upon 380 (74 %) and possibly guilty upon the most fifty-eight occasions (11 % of 513). We have accounted, therefore, for 438 occasions (85 %).

There remain seventy-five occasions upon which Nottinghamshire bills were presented or reported by members who appear to have no connexion, or a very exiguous one, with the county. Clearly here any reckoning can only be approximately correct. Minute and elaborate inquiry into the ties of relationship existing among the members of the eighteenth-century landed class would be of little service without some statistical expression of the ties of friendship and association existing between these same persons. Every available source of information has, however, been used in the effort to transfer as many as possible of these members to those reckoned under other heads. Even so, these forty-five members, seventy-five occasions, and 15%, of the total still remain. By treating as guilty every member who acted for the enclosure of a parish if he sat for a borough whose patron owned estates in the parish concerned; or if he acted in the enclosures of two or three parishes all having the same main landowner; by straining every scrap of evidence; and in no case giving the member the benefit of the doubt, it is possible to gather twenty-seven instances (5%) where there is a possibility that the member in his legislative duties may have been unduly influenced by personal considerations. In the remaining forty-eight instances (10% of the whole) the charge must be dismissed for lack of evidence. The 27 instances, added to the figure of 58 already arrived at, makes 85 occasions—16%—where there is some ground for suspicion. The 48 occasions—10% of the total—are cases where no suspicion lies. The number of cases where the men are certainly innocent remain at 438, a proportion of 74%.

IV

To summarize then: the 171 Nottinghamshire enclosure bills, 1743–1845, were presented or reported by 116 different members on 513 occasions. Of these only eighty-five give the least ground for suspicion that the members' interest in the lands to be enclosed may have led to the infliction of injustice upon other proprietors. Even if injustice were inflicted upon every occasion where there seems to have been the remotest possibility of it, the number of occasions on which enclosures may have been unfairly handled in Parliament because of the members being personally interested cannot be more than some 16% of the total. By any fair computation it must necessarily have been very much less. It is not suggested that these eighty-five occasions are of trifling importance, nor that an eighteenth-century House of Commons was an adequate body for considering the property rights of small proprietors. Probably a parliament of landlords was almost as biased in considering the case for the preservation of a landed peasantry as would be a parliament of colliers deliberating as to the necessity for the continued existence of coal-owners. This essay is not an attempt to whitewash the eighteenth-century landed gentry, but merely to suggest that a great mass of reliable and hitherto very little studied evidence offers small support for the view that they were by any means as black as they have been painted. The extent to which they 'gerrymandered' the enclosure movement in order to serve their private interests and to build up their family estates remains uncertain. But of such manœuvring, carried out deliberately, systematically and on a large scale there is very little trace to be obtained by the most exhaustive examination of the *Journals of the House of Commons*.

GREAT BRITAIN AND CHILEAN MINING

1830-1914

BY CHARLES WILLIAM CENTNER

AT the end of December 1909, no less than £766,647,023 of British capital were invested in Hispanic America,¹ of which amount £343,318,713 were placed in railroads, £289,026,320 in national and municipal governmental bonds, and £18,171,457 in banks and shipping companies. In February 1914, British investments in continental Europe were only 28 % of those in the South American continent.²

Varying between fourth and fifth in value were investments in Chile. Total British capital invested in Chile quoted on the London Stock Exchange at the end of January 1909, amounted to £44,048,405, of which £14,881,060 were in railroads, £8,764,833 in nitrates and miscellaneous investments, and £20,402,512 in government bonds.³ In 1911 British publicly subscribed investments in Chile (£46,375,000) were approximately half as large as those in Brazil (£94,440,000),⁴ and the quantity so invested exceeded by £11,120,000 that in Uruguay and by £14,388,400 that in Peru. Nevertheless, the amount of British capital in Argentinian industries was six times that in Chile. Although the Chilean investments of Great Britain listed on the London Stock Exchange increased by almost 39 % from 1911 to 1913 (£63,938,237 in the latter year),⁵ some of this publicly subscribed capital in London was held by foreigners; therefore, C. K. Hobson has estimated that British investments in Chile at the end of December 1913, by refined computations, did not exceed £61,143,000.⁶

British capital played an important part in the economic development of Chile; yet its function and its distribution among different forms of investment has not been properly understood. The industry which has given Chile its international economic importance is the mining industry. But British participation in the financing of this industry, although considerable, was not as great as is very frequently supposed.

British interest in Chilean mining began during the Chilean revolution when in 1818 David Barry, an English mineralogist, visited the country. He studied coal deposits in the southern part⁷ and three years later published a review of his investigations, expressing a favourable opinion in regard to the possibilities of extensive exploitation of the mineral there. In 1824, Maurice Hall, an English sailor acting as captain of the frigate *Conway*, used coal from Penco as fuel—one of the first instances of the employment of Chilean coal for such purposes.⁸ In

¹ *South Amer. J.* LXVIII (1910), 351.

² Computation based upon Herbert Feis, *Europe: the World's Banker* (New Haven, 1930), p. 23.

³ *South Amer. J.* LXVI (1909), 361.

⁴ Sir George Paish, 'Great Britain's capital investments in individual colonial and foreign countries', *J. Roy. Statist. Soc.* LXXIV (1911), 182.

⁵ *South Amer. J.* CVI (1929), 127.

⁶ 'British oversea investments, their growth and importance', *Ann. Amer. Acad. Polit. Soc. Sci.* LXIII (1916), 31.

⁷ Pedro Pablo Figueroa, *Diccionario biográfico de extranjeros en Chile* (Santiago de Chile, 1900), p. 249.

⁸ *Ibid.* p. 253.

1831, Charles Darwin, then on a world tour, examined the coal deposits of Penco and Talcahuano, but concluded that they were without value.¹

In 1842 exploitation of the coal deposits of the Moro de Talcahuano was systematically begun, and within three years 54,000 tons were mined.² Much of this coal was carried to Callao by the English barques *Jasper* and *Postsea*, and ships of the Pacific Steam Navigation Company, an English steamship company which had begun operations on the Chilean coast, consumed a considerable part of the remainder. The development of coal production in Lota owed much of its early progress to an English engineer, B. Whyte, who introduced current English methods of extraction.³ The coal industry in Lota came under the control of a Chilean company, Cousiño and Son, which used English methods and employed a considerable number of English miners.⁴ Chilean mines were generally operated according to the Longwall system of exploitation, introduced from Great Britain and known in Chile by its English name. Nevertheless, apart from such sporadic manifestations of English interest in Chilean coal development, only one company was formed in England in the nineteenth century to exploit Chilean coal on an extensive basis.⁵ This company, the Arauco Company, was founded in London in 1885 with an initial capital of £500,000 with the object of constructing a railroad from Concepción to Curanilahue and of exploiting coal of the fields of Peumo, Colico, and Descabezado. At the time of its maximum yield it produced 200,000 tons annually.⁶ In 1915 its output was 11% of total Chilean production.

Vastly more significant in effects upon Chilean economic development were British coal exports. Previous to the development of the domestic coal industry, British imports largely dominated the field. As late as 1862 a large importation of English coal into the mining districts in northern Chile resulted in an almost complete suspension of work in the coal mines of Lota and Coronel.⁷ The main factors in the situation were that Welsh coal had a greater thermal-unit yield, but that domestic coal could usually be sold cheaper. Often, however, the two products were used together. In the copper mines of Caldera, Swansea and Chilean coal were so used on an extensive scale as early as 1862,⁸ for it was found that the mixture gave better results than either burned separately. A decade later (1872), 9634 tons of British coal were burned in the Caldera mining district, approximately one-half as much as all domestic coal consumed in that area.⁹ In the following year—an exceptional one—18,464 tons were imported into this district from the United Kingdom—approximately as much as that imported from the Lota and Coronel districts.¹⁰ In 1889, Coquimbo Province

¹ Pedro Pablo Figueroa, *Historia de la fundación de la industria del carbón de piedra en Chile* (Santiago de Chile, 1897), p. 13. ² *Ibid.* p. 253.

³ Guillermo Bollaert, 'Observaciones... sobre las minas de carbón de Chile', *An. Univ. Chile* (1854), p. 363.

⁴ Report of British vice-consul at Talcahuano for 1859; *Parliamentary Papers*, 1862, LVIII (*Accounts and Papers*, vol. xxx), no. 3054, p. 15.

⁵ Comisión del Carbón, *El problema carbonero*, Informe presentado al Supremo Gobierno por la comisión designada por el Ministerio de Industria y Obras Publicas (Santiago de Chile, 1926), p. 31. ⁶ *Ibid.* p. 32.

⁷ Report by the British vice-consul at Talcahuano for 1862; *Parliamentary Papers*, 1863, LXX (*Accounts and Papers*, vol. XLII), no. 3229, p. 53.

⁸ Marcial González, *El carbón mineral i las industrias en Chile* (Santiago, 1862), p. 19.

⁹ Report by Acting-Consul Danelsberg for 1872; *Parliamentary Papers*, 1874, LXVI (*Accounts and Papers*, vol. XXXII), no. 914, p. 52.

¹⁰ Report of Danelsberg for 1873; *ibid.* 1875, LXXV (*Accounts and Papers*, vol. XXXIV), no. 1132, p. 23.

imported 34,907 tons of coal, of which 23,599 tons were from Great Britain and Australia,¹ and in the Iquique nitrate area British coal was extensively used. Fire grates in the nitrate factories were constructed to burn British coal, Chilean coal being mixed with it generally in the proportion of one to three in nitrate manufacture.² In fact so complete was the British dominance of coal imports into that area that the American consul informed his government that no encouragement should be given American coal exporters as to the possibility of successful competition.

In the quarter century preceding the war of 1914-18, the relative significance of imports of British coal in the development of Chilean mining was not seriously altered, for in 1905, the United Kingdom supplied 782,000 tons of the coal imported by Chile (1,179,058 tons),³ although in 1908 more Australian coal was imported than British. Most of the British coal was consumed in the nitrate industry, while that from Australia was principally used by the railroads and industries of Valparaíso and Santiago.⁴ In 1913 Great Britain exported 937,637 tons of coal to Chile—a figure considerably surpassing that of Australia (457,873 tons) and that of the United States (99,979 tons), her two nearest competitors.⁵

It is clear that British capital participated to only a minor degree in the development of the coal industry of Chile. British coal exports prior to 1914 were of much greater significance in the industrial revolution of the country, particularly in mining.

In the production of most other important Chilean minerals, British capital owned a larger proportion of the mines. The extent of its participation in the copper industry was considerable; nevertheless, the history of the expansion of copper mining and smelting in Chile was chiefly that of domestic and American capital.⁶ In Chañaral Alto, to the north of Copiapó, Joshua Waddington, an English capitalist, early in the 1840's was actively engaged in copper mining.⁷ English mining engineers in the middle of the century were largely responsible for the development of the great mine of Carrizalillo, north-east of Pan de Azúcar in the Chañaral district, the Limbo mine of Salado, and the Mondaca of Carrizal.⁸ The Panucillo Copper Company, an English company, was actively engaged in the exploitation of copper in Coquimbo,⁹ and in 1866 it employed 1200 men and extracted 53,207 tons of ore. Three-fourths of the regulus was exported to Great Britain. Extensive mining operations were also carried on by an Englishman, Lambert, in this area in the 1860's.¹⁰ An English

¹ Report by United States Consul Grierson at Coquimbo, 20 October 1890; United States Department of State, 'Coal consumption in Spanish America', *Special Consular Reports*, vi (1891), 37.

² Report by United States Consul Merriam at Iquique, 10 November 1890, *ibid.* p. 38.

³ Report of United States Consul Alfred A. Winslow; United States Department of Commerce and Labor, Bureau of Manufactures, 'Coal trade in Latin America', *Special Consular Reports*, XLIII, part 1 (1910), p. 26.

⁴ *Ibid.*

⁵ Comisión del Carbón [de Chile], *El problema carbonero* (Santiago de Chile, 1926), p. 20, chart C.

⁶ *Engin. Min. J. New York*, quoted by *Economist*, *Mon. Tr. Suppl.* 10 Aug. 1889, XLVII, 8.

⁷ Vicuña MacKenna, *El libro de la plata* (Santiago de Chile, 1882), p. 282.

⁸ Francisco Marcial Aracena, *Apuntes de viaje, la industria del cobre en las provincia de Atacama i Coquimbo* (Valparaíso, 1884), pp. 130-2.

⁹ Report by Consul Gollan of Coquimbo for 1866; *Parliamentary Papers*, 1867-8, LXVIII (*Accounts and Papers*, vol. XXIX), no. 3953, p. 2. ¹⁰ *Ibid.*

investor, Edward Abbott, owned mines and amalgamating works in the Caldera area valued at 150,000 pesos in 1864; and in the Chañaral district the very rich copper mines of another Englishman, Waters, were valued at approximately one-half million pesos at that time.¹ British companies interested primarily in the copper of Caldera included in 1864 Sewell and Patrickson with 500,000 pesos invested; the Mexican and South American Company—then in process of liquidation—with smelting works valued at 180,000 pesos; the Copiapó Smelting Company which had invested 300,000 pesos; and finally, of greatest importance, the Copiapó Mining Company with 800,000 pesos placed in copper and silver mines. This company, the oldest established company in the province,² later known as the Copper Mines of Copiapó, has carried on operations continually from its foundation.³

British capital invested in the Caldera area in 1864, almost all of it in copper, totalled 4,739,000 pesos.⁴ This sum was the greatest investment of any foreign country in that area. During the next half-century, however, British investments in Chilean copper mining relatively decreased; French and, more particularly, American capitalists became interested in Chilean copper—the latter particularly in the present century. At the end of the war of 1914–18 British investments were relatively unimportant.⁵ At that time only 2,100,000 pesos of British capital were invested—1.57% of the total investments. The relative insignificance of this is shown by comparison with American investments which totalled 115,100,000 pesos, or 86.73% of all capital invested in the industry. Domestic capital at that time represented only 4.47% of the capital.

In the production of two other minerals British capital was more heavily involved at the end of the century—borax and nitrate. The borax industry came under the control of British capitalists probably more nearly completely than any other Chilean industry. The nitrate provinces of Tarapacá and Antofagasta contain most of the borate deposits of the country. In 1887 Chilean borax production took primacy in the world, and since that time Chile's position has been assured. In 1898 the Borax Consolidated Company was formed in London to exploit the beds of Ascotán in Antofagasta.⁶ Approximately £130,000 was invested in the Ascotán area at that time; subsequently these investments were increased and Chilean borax production came to be controlled almost entirely by British capital.⁷ Production of the company has varied; it was 50,225 metric tons in 1913, 6603 in 1918, and 17,541 in 1921.⁸ The ports employed have been Mejillones and Antofagasta.

¹ Report by the Vice-consul at Caldera for 1864; *ibid.* 1866, LXIX (*Accounts and Papers*, vol. xxxi), no. 3582, p. 514. ² *Ibid.*

³ Isaiah Bowman, *Desert Trails of Atacama* (American Geographical Society, special publication no. 5; edited by G. M. Wrigley; New York, 1924), p. 180.

⁴ Report by the vice-consul at Caldera for 1864; *Parliamentary Papers*, 1866, LXIX (*Accounts and Papers*, vol. xxxi), no. 3582, p. 514.

⁵ Santiago Marín Vicuña, 'La industria del cobre en Chile', *Rev. chilena Hist. geogr.* xxxiii, no. 37 (1^{er} trim. de 1920), p. 152; Santiago Macchiavello Varas, *El problema de la industria del cobre en Chile y sus proyecciones económicas y sociales* ('Seminario de Ciencias Económicas y Sociales de la Universidad de Chile', vol. II; Santiago de Chile, 1923), p. 108.

⁶ Eulogio C. Lorca, *La industria del borax* ('Congreso chileno de minas i metalurjia, Trabajos presentados', vol. IV; Santiago de Chile, 1916), p. 14.

⁷ American Bankers' Association, Commission on Commerce and Marine, *The South American West Coast; an economic and financial survey of Chile, Bolivia and Peru* ([n.p.], 1925), p. 13.

⁸ Charles A. McQueen, *Chilean Public Finance* (United States Department of Commerce, 'Special Agents Series', no. 224), p. 106.

The greater part of British capital invested in Chilean mineral production has been in nitrates. The nitrate-producing areas of Chile were largely acquired in the War of the Pacific. British capital was not relatively of great importance in the development of nitrates in these areas prior to their acquisition by Chile, for in Tarapacá, British-owned *máquinas* produced only 700,000 of a total output of 3,200,000 quintals between 1870 and 1872.¹ Prior to the forced liquidation of foreign *salitreras* British capital controlled fewer than 14% of the establishments.²

The pioneer in British nitrate investments in Chile was John Thomas North, who as an employee of a company of Leeds had been commissioned to construct machinery in Tarapacá for the exploitation of nitrates, but had been unable to carry out his commission. In the early 1870's he set about developing Peruvian nitrate and guano deposits. North contributed a water-condensing machine to the city of Iquique, established steamship offices, and carried on many successful mercantile transactions. He thus gave new life to the economic development of this area. In 1875 he settled in London. Upon the outbreak of the War of the Pacific, North declared his sympathy for Chile.

In 1879, before Peru had suffered military defeats, nitrate certificates were sold in Lima indiscriminately at 60% of their nominal value and without reference to the specific *oficina*.³ After the battle of Miraflores, which was a Peruvian defeat, certificates with a nominal value of £183. 6s. 8d. (1000 Peruvian pesos) might be purchased at from £20 to £30 sterling. North learned of the intention of the Peruvian Government to turn the *oficinas* over to private industry. He and Robert Harvey, a nitrate inspector, were therefore in a position to purchase a considerable quantity of certificates giving them ownership of the *oficinas* Primitiva, Peruana, Ramírez, Buen Retiro, Jaspampa, Virginia, and others.⁴ The *oficina* Ramírez was purchased for less than £5000 and later sold by Harvey for £50,000. Sixteen certificates giving possession to the *oficina* Virginia were purchased for £4000 and later sold for £18,000. Upon the basis of these acquisitions were formed in London the Primitiva Nitrate Company, the Colorado Nitrate Company, and the Liverpool Nitrate Company. The Banco de Valparaíso was an important factor in providing North and Harvey with funds in the early stages of their operations,⁵ more than 600,000 pesos being lent by this bank. In 1889 North purchased the *estacamento* Lagunas for £110,000 and then disposed of it for more than £800,000 in London;⁶ he likewise realized enormous profits from the Primitiva *oficina*.⁷ He was an important influence in the establishment of the important Bank of Tarapacá in London. Known as the 'Rey de Salitres', North was clearly the most important of the British nitrate capitalists during the nineteenth century.

In 1878 companies financed by Peruvian capital produced 58½% of South American nitrate; in 1901 British companies mined 55% of the nitrate.⁸ In August 1884, in Tarapacá, nitrate establishments controlled by domestic capital mined 773,000 quintals, those owned by foreign capital, 771,400 quintals, of

¹ Guillermo E. Billinghurst, *Los capitales salitreros de Tarapacá* (Santiago de Chile, 1889), p. 18.

² *Ibid.* p. 30.

³ *Ibid.* p. 49.

⁴ *Ibid.*; M. B. Donald, 'History of the Chilean nitrate industry', *Ann. Sci.* 1 (1936), 194-5.

⁵ *Ibid.* p. 63.

⁶ Francisco Valdés Vergara, *Problemas económicos de Chile* (Valparaíso, 1913), p. 109.

⁷ André Bellessort, *La jeune Amérique: Chili et Bolivie* (Paris, 1897), pp. 92-3.

⁸ American Bankers' Association, *South American West Coast*, p. 12.

which 305,500 quintals were produced by British companies.¹ At that time there were four principal nitrate establishments controlled by British capital in the province: Agua Santa, Palma, Ramirez, and Yungay Bajo.

The year 1888 marks the beginning of a new period in British participation in nitrate production. In that year and in 1889 a large number of the *oficinas* were acquired by English joint-stock companies.² Some fourteen *oficinas* in Tarapacá and approximately six *salitreras* in the Sur del Loa were sold in London to companies organized with the object of acquiring these properties.³ Founded at this time were the Nitrate Provision Supply Company, the San Pablo Nitrate Company, the San Jorge Nitrate Company, the San Donato Nitrate Company, the San Sebastian Nitrate Company, the Tarapacá Nitrate Company, and the Nitrate and General Investment Trust Company.⁴ English joint-stock companies exploiting or planning exploitation of nitrate *oficinas* in Tarapacá had a total subscribed capital of £1,645,000 on 8 February 1889.⁵ Their value was £4,675,500 at that time. In 1895 British nitrate companies produced 59½ % of Chilean nitrate exports.⁶ In 1901 forty-eight British *oficinas* were in operation and their production was 20,184,000 quintals.⁷ Twelve German, eleven Chilean, and eight Spanish *oficinas* produced approximately 70 % as much.

The tendency in following years was that of relative British decline and of increase in the percentage of domestically owned companies. In 1907, 15,396,258 quintals, or 40.686 % of Chilean nitrate exported, were yet mined by British companies,⁸ but in 1911 Chilean companies produced 31.02 % of the quantity exported; British interests, 25.07 %.⁹ In 1914 a sum of £28,000,000 was invested in the Chilean nitrate industry of which £11,000,000 was British.¹⁰

Although British investments in Chilean mining were thus heavy in the nineteenth century, they were less so than the student of British economic expansion might have assumed. Although English mining experts and methods influenced the development of the Chilean coal industry to a considerable extent, only one British company was formed to mine Chilean coal, production of which was primarily financed by domestic capital. The history of copper mining in Chile during most of the century likewise was fundamentally one of native enterprise and domestic finance. In the quarter-century preceding the war of 1914-18, French and, even more, American capitalists became interested in the industry, and by the end of the period the quantity of British capital invested became relatively unimportant. The borax industry, however, was almost monopolized by the Borax Consolidated Company, but borax was not one of the principal minerals. In fact, only in nitrate production were there large investments of British capital. British nitrate companies produced 59½ % of nitrate exports in 1895; thereafter their relative importance declined, so that in 1911 they accounted for only 25.07 % of total Chilean exports of the mineral. In 1914, 39 % of the capital invested in the nitrate industry was British.

¹ Billingham, *op. cit.* p. 62.

² W. H. Newman (British consul) to the Marquis of Salisbury, 19 Jan. 1889, Valparaíso; *Parliamentary Papers*, 1889, LXXVII (*Accounts and Papers*, vol. xxxi), no. 5619, p. 1.

³ Billingham, *op. cit.* p. 76.

⁴ Ministerio de Hacienda [de Chile], *Fomento de la industria salitrera* (1889), pp. 125-35.

⁵ *Ibid.* p. 133.

⁶ Fernando López Loayza, *La provincia de Tarapacá* (Iquique, [1913]), p. 71.

⁷ Rudolf Dunker, *Wirtschaftsstudien aus Südamerika, speziell über Chile* (Leipzig, 1910), p. 108.

⁸ López Loayza, *op. cit.* p. 71.

⁹ *Ibid.*

¹⁰ *Economist*, LXXIX, no. 3720 (12 Dec. 1914), p. 1023.

Despite the fact that mining was the principal source of Chilean wealth, British investments in Chile were placed primarily in other industries. In 1909 less than one-fifth of British capital in Chile was in the nitrate industry; investments in the exploitation of other minerals were small.¹ The British investor clearly preferred the greater relative security of railroad investments and government bonds with diversification of holdings to concentration in mining. Fluctuations in output of and return from mines were important factors in this regard. This situation may be contrasted with American investments which were estimated at \$225,000,000 in 1918, of which 75 %, or \$170,000,000, was placed in two companies established to mine Chilean copper—the Chile Copper Company and the Braden Copper Company. Much of the remainder was invested in nitrate properties.² A collapse of British mining investments in Chile and elsewhere in South America in 1825 was an important influence in producing the lack of great interest by British investors in Chilean mines in the second and third quarters of the century. Nor is it probable that the Chilean mining industry could have absorbed most of the British capital available for investment in the country. Fundamental likewise was the fact that British investments in nitrates came relatively late in the nineteenth century. By 1891 the Chilean Government had made loans in London aggregating £21,596,912; moreover, the foundations of British railroad investments in Chile were made before and during the War of the Pacific so that investments in nitrates—the principal British interest in Chilean mining—came after a large part of British investments had been made in Chile and were forced to meet strong continental as well as domestic competition.

¹ *South Amer. J. and Brazil and River Plate Mail*, LXVI, no. 13 (27 Mar. 1909), p. 361.

² It is to be remarked that extensive American investments in Chile are a development of the present century.

REVIEWS

MEDIEVAL AGRICULTURE

The Cambridge Economic History of Europe. Edited by J. H. CLAPHAM and EILEEN POWER. I. *The agrarian life of the Middle Ages.* (Cambridge University Press. 1941. pp. xvii + 650. 30s.)

Although Eileen Power did not write a line for this volume, she has left no finer memorial. In Dr Clapham's words, it was planned by her 'as a complete whole'. She planned it, and if need be it can stand alone as a great survey of the agrarian life of the Middle Ages. With Dr Clapham's generous acquiescence, we can do what she would never have allowed us to do if she had lived to co-operate in and initial the preface—we can think of it as her book, as the child of her enterprise and originality and courage, of her comprehensive response to all the important work on the subject which was going on throughout the learned world, of her widely scattered friendships, of her lively yet earnest enthusiasm. And we may be sure that, if we knew more, we should find that this book owes much to her ability to learn from others, to profit by their advice, to find a way round obstacles without wasting time or energy in regrets, to efface herself in the service of her task.

It is very fortunate that one of the Cambridge histories, late in the day, was entrusted to two such vigorous and independent minds as those of Dr Clapham and Eileen Power. They had no heritage, no commitments. They could learn from the experience of the editors of previous Cambridge histories yet they both start afresh. No doubt they had a definite theme, or subject or 'aspect' of history and, it may be said, this fact alone would give a unity to their work which their predecessors in other series had to acquire painfully for themselves; but personally I should dispute this suggestion. It does some injustice to the success won from experience in revealing the unity of history in the later Cambridge histories, and it overlooks the arid and inhuman association with which economic history can still be beset. One trembles to think what a co-operative economic history of Europe might have been. The disaster has been averted, and, so far as is possible, the dangers latent in the treatment, and especially in the joint treatment, of an 'aspect' of human experience have been boldly and successfully faced. The editors have not resisted a temptation—it would be impertinent to say any such thing—for one of their chief qualifications for their responsible task is that they were not conscious of any temptation to resist. At any rate, there is nothing arid or inhuman or artificial in this first volume.

I have written above 'so far as is possible', for we should not expect to find miracles in any Cambridge history. There are some problems on which no book of this kind can speak with a clear voice, still less pronounce a solution. The central theme of the volume is the manor and its various equivalents, and the problem of community is bound up with the history of the manor. 'As far back as we can go, we find the two institutions'—the *seigneurie* and the village community—'living side by side'. So says Professor Marc Bloch (p. 264) as he has said elsewhere. Professor Hans Nabholz does not read the evidence in quite the same way: 'Before the thirteenth century our records make no mention of organized village communities with any rights of their own' (p. 533). The two statements are not in flat contradiction with each other, for the words 'with any rights of their own' suggest a way of accommodation between them; but, as he

proceeds to point out, Professor Nabholz sees in early agreement among the peasantry a response to definite needs. There were, for example, the men in eleventh-century Languedoc who took counsel with their lords about the organization of the rural economy. There was the need to maintain the parish church, or the need for defensive action against encroachment by the lord. The writer has not in mind a primitive communal life, but precedents and necessities for the creation of autonomous communes, whereas M. Bloch is more concerned with and lays more stress upon something embryonic, just as, looking at the matter from the other side, he says that legislation did not create the Roman colonate. The colonate 'could hardly have worked—probably the very notion of it could not have arisen—unless it had been based on social customs which had long favoured the dependence of the weak... The system of the colonate is only intelligible if we suppose that there existed before it a sort of embryo *seigneurie*' (pp. 247, 248). Both M. Bloch and Professor Nabholz are clear headed men who argue from evidence. We have gone far beyond the day when the different points of view which they represent seemed to be a difference between generous mystification on the one hand and narrow logic on the other; but the fundamental difference still remains. Of course it is easy to exaggerate the practical significance of the difference. The rejection by both sides of the *a priori* argument, e.g. that the existence of an institution necessarily dates it, as though village communities or ways of agriculture could not be the outcome of deliberate contrivance,¹ has immensely increased the ground common to both. This book gives striking testimony to the advance made by continental scholars during the past generation. So much has been done in local studies that its significance has been hidden; but at last, thanks to a fine piece of synthesis, we can get behind the old to new generalizations. Some time must go by before the new become familiar or are even clearly defined. Any attempt to summarize them would be premature. The book must gradually make itself felt both as a mine of information and as a new starting point. That the various writers are on common ground is the important thing to notice here. The differences of view, most of which are noted by Dr Clapham in footnotes, are the differences which arise within a common ground, between scholars who use the same methods of investigation and are not trying to prove a case. The most serious, I think, can be seen in a comparison between the contribution (ch. 1) of Professor Richard Koebner (rightly described by the editor as 'the most massive of our chapters') on the settlement and colonization of Europe, and that (ch. iv) of Dr Alfons Dopsch on agrarian institutions of the Germanic kingdoms from the fifth to the ninth century. The two scholars happen to an unusual extent to be concerned with the same theme and I fancy that the depth and range of Professor Koebner's introductory work has in this case put the original plan somewhat out of focus, so that Dr Dopsch's chapter might well have been dovetailed into the first chapter if not omitted. Not that we need regret this result, for, without any disrespect to the work of his distinguished colleague, we could not find anywhere a more important and illuminating introduction to European history as a whole and not many from an agrarian standpoint than Koebner's fine survey. I hope that it may some day be issued separately in an expanded form, more easy to follow. It tells us so much that we need to know and yet cannot conveniently find put together elsewhere.

The general plan of the volume is simple. Three chapters give a survey of the subject in a chronological sequence. These are Professor Koebner's, to which I

¹ How late in history, for example, can we find the emergence for the first time, as something new, of the open field system? The late Charles Henderson, who is followed on the whole by Mr Rowse, thought that this came late in Cornwall. See A. L. Rowse, *Tudor Cornwall*, pp. 33-6.

have referred, Professor Marc Bloch's on the rise of dependent cultivation and seigniorial institutions (ch. vi) and the concluding chapter (ch. viii) by Professor Nabholz on medieval agrarian society in transition. The gist of the book is really to be found in these three chapters, but personally I would recommend readers to begin with the second chapter, a brilliant study of agriculture and rural life in the later Roman Empire by Mr C. E. Stevens. Mr Stevens's chapter is more far-reaching than its title suggests. It incorporates his own and other learning on the origin and development of the closed and open field systems and gives a geological and geographical basis to the history of agriculture in Europe. After this and the three general chapters I should read Professor Ostrogorsky's chapter (ch. v) on agrarian conditions in the Byzantine Empire in the Middle Ages, for this provides a clear-cut survey, very satisfying to the mind, of the interplay, in the rural economy, of social and political forces and of their expression in legislation, such as one cannot hope to find in the west. Ostrogorsky shows how and why the gradual transition from the peasant soldier to the great landowner as the chief support of the empire was reluctantly recognized by the government. In this chapter the forces of autocracy appear as the agent, while they profess to be in control, of changes too great for them to resist. More self-conscious, more orderly, more united than the administrations of the west, the Byzantine administrative system reflects in a more coherent way movements and problems common to all.

The rest of the volume comprises a chapter (ch. iii) by Professor Charles Parain on the evolution of agricultural technique—the most useful part of which is concerned with work and implements—and a solid section (ch. vii) of more than two hundred pages on medieval agrarian society in its prime. Here the object has been to supplement the more general surveys by more detailed studies of agrarian society in the particular regions of Europe, including Russia, particularly in the thirteenth and early fourteenth centuries; but naturally enough the various writers, eight in number, who have contributed to it, have dealt with their particular subjects in different ways, and a good deal of overlapping with the general chapters has been unavoidable. A reader in pursuit of conditions in a particular area cannot afford to neglect any part of the book, and should familiarize himself with the table of contents and the index.

I have described the structure of the book. The contents are quite beyond the powers of a single reviewer. They are not easy reading, for, when all has been said, the fact remains that this volume contains much pioneer work as well as a résumé of the existing state of knowledge. The first and the last chapters, for example, are packed with detail intended to illustrate some kind or other of development, just as the detail in the regional section is often subordinated to a general survey, as indeed was required in studies of Spain, Hungary, Russia, Scandinavia and the Slav lands. In the present state of historical scholarship, no amount of editorial skill could have avoided this result. Moreover, the personal element plays a large part, as a comparison of the work of Professor Ganshof on France, the low countries and western Germany with that of Professor Nellie Neilson on England will show: the one is a survey so systematic as almost to deserve the epithet philosophical, a discussion which supplements that of Professor Bloch, the other is more like a little encyclopaedia, so balanced and so packed by reservations and qualifications, that the general effect is a blur. I do not write this in any depreciatory sense. After all his generalizations have been stated and the tumult of workmanship has died away, English agrarian society in its medieval prime is a blur. All the same, I am tempted to wish that Miss Neilson had been a little less cautious.

One thing will not be found in this book, although without it any description of medieval husbandry lacks the life which it gave and took in society as a whole.

Much is said about money and the irregular developments of a cash economy, and something is said about the marketing of surplus production; but no account is given of the way in which this change worked. Often I am inclined to think that the biggest gap in our capacity to see, to see clearly and concretely, the medieval rural world is due to ignorance about the circulation of the little silver pennies. How and whence did they come? Where were they kept? How did they return after they had been drained away in fines and taxes and papal subsidies and the like? Hitherto we have had to depend for an answer, so far as any answer has been given to these and other questions, upon learned meditation in terms of economic laws, and perhaps, in the absence of definite evidence, we must continue to depend upon this; but it is not the same thing and can never be so satisfactory as the kind of picture which evidence can give. I hope that, when the problems of currency are discussed in a later volume, the discussion will not overlook the familiar yet inscrutable incidents of rural life.

There are many good charts, plans and pictures in this volume. It is good to have illustrations as well as the usual competent apparatus of bibliographies and index.

F. M. POWICKE

CARMARTHENSHIRE

A History of Carmarthenshire. Edited for the London Carmarthenshire Society by Sir JOHN E. LLOYD. 2 vols. (Cardiff. 1935-9. pp. xix + 374 and xv + 549.)

The subject of local history commands widespread interest in Wales, yet it must be confessed that Welsh county histories are not well represented in our historical literature. Only a few counties received the attention of the older antiquaries and Wales was, unfortunately, not included in the Victoria County History scheme. It may well be argued that the county, where it does not conform to a regional division, is hardly an appropriate unit of local study. This is particularly true in Wales where many of the counties are but arbitrary creations and of late date.

The present work has its origin in a laudable and public-spirited attempt on the part of the London Carmarthenshire Society to bring together a readable story of the past history of their county—a county unusually rich in its historical material inasmuch as it was the oldest of the Crown possessions in Wales and, as such, retains for some centuries an almost unbroken record of its history. Much of the work was in the nature of a pioneer effort, and the Editor and those who co-operated with him must be congratulated on the completion of a difficult undertaking.

The story has been brought within the compass of two large volumes covering the periods before and after the Act of Union respectively and the general plan reflects in part the demand for a semi-popular presentation of the subject. The political, ecclesiastical and social history receive special treatment, and separate sections are devoted to such subjects as castles, boroughs and religious houses. This contrasts with the older, more topographical treatment according to parishes. There is much to be said in favour of the two methods of approach, but the ideal would appear to combine the special features of both. In the present instance, the need for allocating the various subjects among a team of specialist workers had the effect of weakening the work on the topographical side. In part this has been met by the Editor's brief but excellent description of the boundaries and local divisions and by the provision of a full Index but, these notwithstanding, it is difficult from a perusal of the narrative to obtain a clear conspectus of the region as a whole and its component parts or to follow their

course throughout the centuries. There are the inevitable problems, too, inherent in all composite work, and the burden of the editor is immense if the various parts are to be co-ordinated into a single whole and the danger of overlapping eliminated. The several chapters in themselves are informative but they vary much in quality and there are significant omissions. The story of the medieval church in the area receives but scant attention and little is said of the activities of Roman Catholicism during the post-Reformation period, while in the section on the Established Church the author contents himself, for the most part, with recording the lives of the bishops of St Davids. The work, as a whole, in the absence of printed literature, has involved a considerable amount of reference to original sources, but at times the reader is, perhaps, too conscious of the raw material from which the narrative is compiled. Certainly, the narrative would gain in clarity if some of the minor detail were jettisoned and a fuller use made of illustrations directly bearing on the text.

Readers of the *Economic History Review* will probably find their main interest in the sections dealing with Economic and Social History, but these, though they contain much valuable information, are on the whole disappointing. Here much investigation remains to be carried out and the story has, perforce, to be sketchy, but the division of the work among various contributors—under the heads Agriculture, Woollen Industry, Iron and Coal, Non-ferrous Metals—makes any general picture of the changing economy obscure. We are indebted to the various contributors for much sound and valuable information bearing on the development of the various industries and the statistics of production, but, in this much-divided field, it falls to none to examine the interaction of the various industries or to trace the effect of their impact upon a predominantly rural society. The problem of labour in all its aspects is hardly touched upon, nor, indeed, is that of Poor Law Administration. It is, perhaps, unfortunate that some practised hand did not bring together these and other manifestations of the new industrial order as they are reflected in Carmarthenshire.

It remains to add a word of commendation to the printers for their part in the production of two attractive and handsome volumes. WILLIAM REES

DUTCH ECONOMIC HISTORY

W. S. UNGER. *De Tol van Iersekeroord. Documenten en rekeningen 1321-1572.* (Rijks Geschiedkundige Publicatiën, Kleine Serie 29. 's-Gravenhage, Martinus Nijhoff, 1939. pp. xv + 685.)

It is unlikely that many readers of this review will have heard of the Toll of Iersekeroord. And yet one may say, without exaggeration, that at the opening of the modern period it was, with the possible exception of those on the Rhine, the most important toll levied in western Europe. For the Toll of Iersekeroord was the principal toll levied on the water-route between Antwerp and the North Sea, a route along which there then passed a greater proportion of the world's sea-borne traffic than has ever been concentrated upon a single route before or since.

It is only in recent years that the toll has been made the subject of serious investigation, and there is still no adequate account of it. Dr Unger himself published a brief outline some years ago, and in the introduction to the present volume he presents the main facts and dates again. Whether he has since produced the detailed study which he was planning before the catastrophe of 1940, and which he alone is competent to write, the reviewer does not know. In the present volume Dr Unger has collected together the chief documentary material relating to the toll. This material falls into two classes: documents and accounts.

The former comprise sixty-two items, ranging from 1321 to 1566; they include ordinances governing the leasing of the toll to corporations and individuals, schedules of toll-rates, grants of exemptions and reports of judicial inquiries into the continual disputes to which such grants gave rise. The reviewer, who spent some years before the appearance of Dr Unger's volume in collecting material relating to the toll, can testify to the excellence and comprehensiveness of the present selection. Most of the documents are printed *in extenso*, and the remainder briefly calendared. Dr Unger follows the practice generally observed in the R.G.P. series of not reprinting documents already in print elsewhere. Thus several of his items consist merely of a brief description of the document followed by a reference. An editor feels a natural reluctance to devote valuable space to documents already published, but to the reader, especially the foreign reader, such entries are always annoying, and often spell frustration.

But Dr Unger cannot plead even this justification for his cavalier treatment of what is undoubtedly the most important single document in his collection, namely, the decision promulgated on 11 October 1504 by the Great Council of Mechlin in the dispute between the States of Brabant and the town of Middelburg. Into the history of this complicated dispute, which the parties had been waging for eight years, but whose origins are to be sought at least a century earlier, we cannot enter here; sufficient to say that the point at issue was whether the Duke of Burgundy, as Count of Holland and Zealand, had the right to levy his toll of Iersekeroord (leased since 1470 by the town of Middelburg) upon ships and cargoes which merely used the Zealand waters on their way to and from Antwerp and other Brabant towns. In view of the magnitude of the interests involved, the case was of the utmost importance. But if to contemporaries it was the Great Council's verdict (which was given in favour of the Duke and his lessees) which mattered most, to the historian the main interest of the document in which that verdict was pronounced lies in its lengthy review of the levy of the toll during the preceding century, for this contains much information unobtainable elsewhere. This document is no. 38 in Dr Unger's selection. All that had previously been published of it was its introduction and the brief conclusion containing the verdict; but between them lay sixty odd pages of unique value, which remained in MS. How disappointing, then, to find, in a collection where one had reason to expect, if not the entire document, at least long extracts from it, that Dr Unger has been content merely to print the conclusion, thereby contravening his own rule, for this was already to be found (in French, it is true, since it came from the contemporary French version of the document in the Antwerp archives) in Denucé's *De Loop der Schelde van de zee tot Rupelmonde in de XVe eeuw*.

As a prologue to the toll-accounts which make up three-quarters of the volume, Dr Unger gives us a valuable statement of the annual yield of the toll over the period 1346-1572 in so far as he has been able to extract the figures from the accounts of the responsible official, the Rentmeester van Zeeland Bewester Schelde. As he reminds us, for technical reasons these figures need to be used with caution. They do, however, show the extraordinary increase in the value of the toll, especially after 1500, and thus illustrate statistically the growth of Antwerp's trade during the period.

The extant accounts of the toll itself, with the exception of an isolated early specimen for 1418, and a similar late one for 1570, relate entirely to the years 1470-1499, during which the town of Middelburg was lessee of the toll and preserved the accounts in its archives; and of these accounts Dr Unger could find space for only a small part. Bearing in mind the considerable variations in form and substance from one set of accounts to the next, and the exemptions and special privileges which resulted in the omission from them of many ships

which sailed these waters, we must recognize that these accounts are in most respects inadequate as a basis for generalization. But their detailed record of ships, shippers, and cargoes throws much new light upon the water-borne trade of this region at its period of greatest prosperity, as well as numerous sidelights upon the society which that trade existed to serve.

Two indexes enable the student to locate the references to any person, place, or commodity mentioned in which he is interested. English students of the period may like to know that, although the bulk of English trade to Antwerp, being admitted to the Netherlands on the special terms granted by successive Dukes of Burgundy, is not reflected in the accounts, thirty towns in England and Scotland appear in the index, mostly as ports of origin of cargoes bound to Antwerp.

S. T. BINDOFF

CHARLES WILSON. *Anglo-Dutch Commerce and Finance in the Eighteenth Century*. (Cambridge University Press. 1941. pp. xviii + 235. 15s.)

Mr Wilson has produced the interesting and scholarly study which readers of his recent article, 'The Economic Decline of the Netherlands', in Vol. ix, No. 2, of this *Review* had reason to expect. The title of his book aptly reflects its structure, for Anglo-Dutch trade is the subject of Part I (pp. 3-62), and Anglo-Dutch financial relations of Part II (pp. 65-196). What the title cannot convey, however, is the connexion between the two, a connexion which not only gives the book a satisfying unity but also furnishes its main thesis. Stated baldly, this thesis is as follows. During the eighteenth century Anglo-Dutch trade shrank rapidly in volume and importance. This was part of the decline of the Republic's commerce as a whole, and was due, in the last analysis, to the same general cause, namely, the progressive substitution of direct trading between European countries for their former indirect trade through the Republic, which had been at once a prime source of Dutch prosperity and a main field of investment for Dutch capital. The decline of Dutch trade, and along with it of those industries—notably the Haarlem bleacheries—which depended upon it, drove Dutch capital to seek safer and more lucrative employment, and nowhere was this more readily found than in England, for England, while increasingly independent of Dutch goods, Dutch shipping and Dutch commercial services, was always ready, and at times anxious, to use Dutch money. Hence, especially between about 1740 and 1780, when the English National Debt soared, Dutch capital poured into England, and the financial element ousted the commercial in relations between the two countries.

In developing this thesis, Mr Wilson has made excellent use of both English and Dutch MS and printed sources, with the Dutch taking pride of place, and among these the Notarial Records preserved in the Gemeente Archief of Amsterdam furnishing the most valuable material—a further illustration of the truth, still not sufficiently recognized by foreign students of Dutch history, that the Dutch Town Archives are in some respects a much richer source than the Rijksarchief at The Hague. From these Mr Wilson has been able to reconstruct his story not merely 'in terms of abstractions or balance sheets' but 'in terms of personal relationships'. He tells not of nameless and dehumanized 'merchants' or 'capitalists', but of John Badcock, merchant, of London, who, amid the more serious business of buying cloth from Jan de Neufville of Amsterdam, undertakes little commissions such as matching a pair of spectacles or supplying a pointer 'who answers to the name of Ponto'; of David Leeuw, a merchant turned financier, whose prudent and profitable London operations during and after the South Sea Crisis, which left him worth nearly £40,000 in the British Funds at his death in 1754, we can follow in detail; of the Van Hemerts, domi-

ciled in London, where they were attorneys for a large clientèle of Dutch investors; and of many more of their kind.

As Professor Clapham says in his pro-editorial preface, it was not for Mr Wilson to follow Dutch investors in their continental lendings, which had begun before, and would continue after, the period of their interest in the London market. This work largely remains to be done, and one hopes that some day it will be taken up, with Mr Wilson's volume as a model of how it should be done, for only a more complete picture of Dutch foreign investments will enable us to answer some of the questions involved. Meanwhile, the present study itself raises some new questions, as, for example, whether, in Mr Wilson's words, 'loans followed politics'. In the second half of the century, with the Dutch ruling class divided into two political camps, the pro-English Orangists and the pro-French Patriots, it would be interesting to know whether a stake in the British Funds normally went with Orangist leanings, and conversely whether the good Patriot shunned them. In that case, the Revolution of 1787, which Mr Wilson does not mention, might have its place in the epilogue to his story.

Mr Wilson has made good use of the secondary literature in both languages. He appears, however, to have overlooked one English book of some importance for the commercial side of his subject, namely, W. G. Hoskins's excellent monograph *Industry, Trade and People in Exeter 1688-1800* (1935), which contains a good deal of information, including statistics, on the trade of the South-West with the Netherlands. Several of the Devon exporters whom Mr Wilson lists on p. 27 are mentioned by Hoskins.

It is a painful thought that the Dutch friends who would have welcomed this book, and to whom all English students of their country's history owe so much, will not, for a time, be able to read it. We wish them a speedy release from their present confinement and sufferings.

S. T. BINDOFF

TUDOR CORNWALL

A. L. ROWSE. *Tudor Cornwall*. (Jonathan Cape, 1941. pp. 462. 18s.)

The writing of this book was obviously a labour of love; and Mr Rowse must have devoted to it long and arduous researches, in even the remotest corners of his field. His knowledge is elaborately detailed and widely ranging. Moreover, the subject is an attractive one and has a unity of its own that is real and not factitious. Mr Rowse possesses also a good narrative and descriptive style. His accounts of the rebellions, of the survival of Catholicism in Cornwall, and of Cornwall's part in the Elizabethan war with Spain are very well done.

Yet in too many places the book is disappointing. The chief reason is Mr Rowse's anxiety to tell us of his own 'ideology' (a word he seems to like) and prejudices. We are, for instance, reminded rather too often that Mr Rowse dislikes Protestant Non-conformity; and there is too much running commentary of a needlessly cynical kind. Most of us would prefer an account of sixteenth-century religious conflicts which omitted Mr Rowse's personal opinion that they were 'idiot quarrels over obscure doctrinal points, which meant nothing anyway'. Nor are we necessarily edified by Mr Rowse's reveries in front of bishops' tombs, still less by topical reflexions such as 'How like the Home Guard to-day, and how little human activities change!' Some of these personal touches detract from the dignity of a serious book. Occasionally Mr Rowse seems to be guessing what he cannot know; that the prior of Fowey was drunken because 'no doubt he found the world depressing'; or that Agnes Prest, the Protestant martyr, must have been 'a bore', because no doubt she is so to Mr Rowse. The author finds it 'anachronistic perhaps even to disapprove'

of the infliction of martyrdom; but not so, apparently, to ridicule the martyr's faithfulness. Much of this ridicule defeats its own end, since figures of fun are lay-figures which never fully come to life.

There are times when the reader will regret Mr Rowse's tendency to play with his pieces before they are arranged on the board. Admittedly this is not easily avoided in a book of such a kind, but a clearer exposition of the *dramatis personae* would have been helpful. Nor are we made very fully aware of the background and setting of the drama; of what, for instance, really caused the rebellions and the religious changes. Nor is it quite clear how far Mr Rowse regards his Cornwall as a microcosm of Tudor England and how far as an isolated and peculiar world.

Mr Rowse is not always happy in his handling of parenthesis and apposition, and occasionally his choice of words can be misleading. For example, by 'the myth of sovereignty', in which we are told 'everybody believed', he must mean something quite vague like 'kingship' rather than the legal fiction which has an exact meaning but had not yet been seriously thought of, even by the lawyers. Indeed, on constitutional matters Mr Rowse does not completely inspire our confidence. He has an argument about the creation of new parliamentary boroughs in Cornwall, but fails to make it clear how he really differs from previous historians or what exactly he is arguing against. We should all agree that kings and queens might have wished to strengthen their influence in the Commons without envisaging any actual or potential conflict with the House, and that a remote county, which had acquired a new importance as a frontier province, might well have needed new members to give it a special liaison with the central government. It is odd that the author should refer more than once to the researches of Savine and yet insist on calling him Sabine. The Protestant exiles, returning in 1558, are called predominantly Calvinist; if Mr Rowse had been less contemptuous of religious differences, he would have remembered that Zurich, where most of the exiles had been, was a Zwinglian city.

Mr Rowse's judgements in the sphere of social and economic history are coloured by Marxism of a somewhat unsubtle kind. There were no economic arguments, we are told, against enclosure (hardly a statement that is universally true); therefore there were no arguments at all against it. Such a syllogism would look a little shaky were it applied, say, to protection. But Mr Rowse has exposed his point of view stark naked in one casual phrase, 'new economic tendencies—in a word, progress'. He picks a quarrel with Tawney, but attributes to him (on p. 59) a view which Tawney never held: mention is also made of the 'Tawney-Weber thesis', in spite of Tawney's highly critical analysis of Weber's theory. One wonders how 'class-feeling' kept Courtenay loyal during the Pilgrimage of Grace, a rebellion of and on behalf of his own class. Of the monks we learn that 'economically they were *rentiers* living on their revenues, and thus especially open to the hostility of the townsmen with their active commercial spirit, who found their maintenance of their passive property rights galling and cramping to enterprise'. Does this mean that merchants disapprove of *rente* or that the townsmen would have welcomed more active competition against themselves on the part of the monks? Incidentally Mr Rowse, like most writers on the subject, tells us how little the monks did for the community, without asking, still less answering, the question, Did those who succeeded to monastic property do any more?

Yet it would be most unjust not to be grateful to Mr Rowse for much *recherché* and fascinating information and for much vivid portraiture. Often enough he has succeeded in making his dry bones live; and that, as he makes quite clear, was what he wanted more than all else to do.

CHRISTOPHER MORRIS

OCEAN IN ENGLISH HISTORY

J. A. WILLIAMSON. *The Ocean in English History*. (The Ford Lectures, 1940. Oxford University Press. 1941. pp. 208. 15s.)

This interesting book suffers from a misleading title. *The Ocean in English History* suggests a rich, age-long diversity of enthralling topics, whereas in point of fact Mr Williamson has limited himself severely, both as to scope and as to date. He is dealing, he tells us, with the years from the opening of the Tudor period to the threshold of the nineteenth century and, during that time, with the development of the Oceanic Interest, 'using the word Interest as it was used formerly in those widely known terms the Landed Interest and the Moneyed Interest'.

Much of the book is in narrative form. Mr Williamson tells and, as readers of his earlier books will expect, tells extremely well the story of England's part in the opening up of the Atlantic, the Eastern Seas and the Pacific; his chapter on the latter is particularly interesting. He does full justice to the pre-Hakluyt propagandists of overseas expansion and emphasizes the results of the shifting of interest, as time went on, from Bristol to London. When he comes to things economic, a good deal of what he has to say comes in only incidentally, as part of the general narrative, and neither here nor in the chapters more specifically devoted to economic questions does he give us much that is new, by way either of information or of comment. It is a pity that Mr Williamson, as he was anyhow confining himself in scope, did not see his way to concentrating on a more limited number of topics in a somewhat less discursive way than his present plan has made possible. We might for instance well have been told more about the repercussions of the East India Company on economic controversies at home; about the very important Baltic trade; about the growing value during the eighteenth century of West Africa; in particular, about the ships themselves and their evolution, and the men who sailed them, how they were recruited, paid and fed, as well as the risks they ran and the casualties they sustained. We should have liked also to know about the men who made up, and profited by, the 'Oceanic Interest'; what sort of folk they were, how their capital was acquired, what was their influence on policy, and so forth. There are a couple of sentences about the inevitable 'nabobs' but we could have done with more, especially for the earlier periods. All this would have been a useful and not unnatural enlargement of Mr Williamson's theme, and one which would have put economic historians heavily in his debt.

But it is perhaps ungracious to ask for more when there is anyhow so much to read with pleasure and profit. There are, further, various pleasant pieces of information which come our way incidentally. How many of us, for instance, know the author of the famous tag (so beloved of examiners) about Spain as a 'Colossus stuffed with clouts'; or that Mary (William's Queen) was one of the earliest collectors of china; or when it was that Pepys drank his first cup of tea; or that Drake set up a brass plate in California in 1579 which was only discovered in 1936?

F. R. SALTER

 PARLIAMENTARY ENCLOSURES

V. M. LAVROVSKY. *Parliamentary Enclosure of the Common Fields in England at the end of the Eighteenth and the beginning of the Nineteenth Centuries*. (Moscow-Leningrad. 1940. pp. 200 (Russian).)

Some of the most valuable work on English agrarian history has, since the days of Vinogradoff, been done by Russians. His pupil Savine produced a series of admirable books and articles on the sixteenth and seventeenth centuries, most of which are still untranslated. Recently the third generation of scholars have

been publishing their researches—Professor Kosminsky for the thirteenth century, Professor Arkhangelsky for the seventeenth century, and now Professor Lavrovsky for the period of the French revolution and the Napoleonic wars.

Professor Lavrovsky's study is based primarily on the enclosure awards preserved at the Public Record Office; and as a subsidiary source he has used the Land Tax assessments. He has studied some sixty selected enclosure awards, with the annexed maps, spread over twenty-five counties, covering all but the outlying regions of England. All his evidence is drawn from the years 1793–1815, during which 48·5% of all the parliamentary enclosures took place. His object was to ascertain the effects of enclosure, previously and during those 22 years, on the various classes of English rural society, and especially on the peasantry. In an album published with the volume he has reproduced 41 maps of enclosure awards, with a commentary.

Professor Lavrovsky's main contribution is to establish statistically the extent to which social differentiation had proceeded among the English peasantry by the turn of the century, the extent to which there already existed a rural proletariat and a peasantry whose holdings were not large enough to maintain them without additional sources of income. In general his conclusions confirm the view of Johnson, Grey and Davies (which was also the view of Marx) that the late seventeenth and early eighteenth centuries (rather than the age of the French revolutionary wars) was the most critical period for the yeomanry and for the peasantry as a whole. Professor Lavrovsky devotes an interesting chapter to a critique of his predecessors. Most attention is paid to Slater and Gonner, but the Hammonds, Savine and Curtler are also considered, in addition to those already mentioned. The last-named is criticized especially severely as an apologist of landlordism and for glossing over the catastrophic effects of the agricultural revolution upon the peasantry.

Professor Lavrovsky's evidence, as he himself continually points out, tends to give a one-sided view, since it takes into account only those parishes which had not been enclosed, or had not been fully enclosed, before 1793. Enclosure, especially of the waste, had taken place much earlier in many other parishes, whether by act of parliament or by private initiative, and Professor Lavrovsky believes that in these parishes class differentiation and the concentration of land would have proceeded further than in those which he has studied.

Professor Lavrovsky despaired of attaching any useful economic significance to the term 'yeoman' in the eighteenth century, and in an attempt to give clarity and precision to his analysis and to avoid the prejudices and passions aroused by that term he divided the peasantry into three categories: (1) those holding over 50 acres; (2) those holding 25–50 acres; (3) those with less than 25 acres. In accordance with Russian custom since Lenin's *Development of capitalism in Russia* he calls these three categories respectively big, medium and small peasants. For the purposes of his analysis he treats as 'landowners of peasant type' any freeholder or copyholder who is not described in the enclosure award by a social or professional title, such as gentleman, esquire, reverend, merchant, banker, etc.

In sixty parishes studied 55·9% of the 91,775 acres were owned by crown, nobility and gentry; 22·5% by peasants; 15·6% was church land and impropriated tithes (including lay impropriations); and the remaining 6% was owned by corporate bodies and representatives of the urban bourgeoisie. Thus the peasantry held less than a quarter of the land even in these late-enclosed parishes. And even among the possessors of that 22·5% there were also very sharp class distinctions between rich and poor peasants. 91·2% of the peasant owners were 'small peasants'; 62·8% held less than 3 acres each (misprinted as 1 acre on p. 174). 4·3% of the peasantry held 47·9% of all the land belonging to owners of peasant type. There was stratification even among the com-

paratively few described in the enclosure awards as yeomen, two-thirds of whom owned less than 25 acres; but the average size of yeoman holdings was 8.3 acres, as against 3.3 for the peasantry as a whole. In both categories the 'middle peasantry' is relatively insignificant, and Professor Lavrovsky considers that his evidence is sufficient to dispose finally of the legend of an independent English peasantry at this date. The big peasants who managed to survive were those who could find the necessary capital to switch over to leasehold farming.

For the figures so far quoted deal only with peasant ownership; they are not evidence of how the land was worked, or by whom. The figures for leasehold are incomplete, but the following relates to twenty-two parishes in which 39.8% of the land is recorded as leasehold. 71.2% of this land was leased by fifty-three big peasants (= 10% of the total number); 450 small peasants leased 16.2%. Taking leasehold, freehold and copyhold together, the big peasantry (10.9% of the total number) occupied 75.6% of all the peasant land for which there are figures; the middle peasantry (5.5% in number) occupied 9.9% of this land; and the small peasantry (83.6%) occupied only 14.5%. The contrast is very striking. Two processes are proceeding simultaneously: the peasant freeholders and copyholders are being divided into two groups, big farmers and poor labourers; and at the same time a few big capitalist lessees are concentrating lands into their possession, pushing the middle and small peasantry into the background. And of course these two processes overlap and interact; big lessees are often also big peasant landowners. The middle peasantry is insignificant.

With respect to the 55.9% of the land held by crown and gentry there are similar divisions. 21.9% of the representatives of this class, those owning estates of over 100 acres, held 83.5% of this land, and 54.8% of the total number held in all only 3.6% of the total of land held by this class. But presumably these small holdings rarely represent the *total* of land owned by the given gentlemen, and the figures are to that extent misleading. (This consideration may also affect the statistics for peasant owners, but to a much less significant extent.) The evidence, as Professor Lavrovsky suggests, confirms Savine's thesis of the gentry 'stooping to conquer' in the sixteenth and seventeenth centuries, acquiring land in small parcels, even as copyholders.

As Professor Lavrovsky showed in his article in volume IV of this review, commutation of tithes at enclosure also helped to diminish the peasant share of land. The acreage held by ecclesiastical owners increased by 8413 acres (58.9%) as a result of enclosure. The area commuted for tithes came to $\frac{1}{4}$ (and not $\frac{1}{10}$) of the total enclosed area.

To summarize Professor Lavrovsky's conclusions: the independent peasantry had already ceased to exist, even in unenclosed parishes, by the end of the eighteenth century. An agricultural bourgeoisie had grown up, few in numbers but predominant in acreage owned and leased, employing wage labour to produce agricultural commodities for the market. The other side of this picture was the almost total disappearance of middle peasant proprietors, and the conversion of the small peasantry—still very numerous—into an agricultural proletariat. And this had occurred in unenclosed parishes, showing that though enclosure might facilitate it did not cause the process.

Despite the fact that there was no breach of legal continuity in England, the reconstruction of the English countryside was a great deal more radical than what occurred in revolutionary France. In France feudal relationships were abolished at one legislative stroke; in England the same result was attained by the expropriation of the peasantry, the growth of big landownership in the seventeenth and eighteenth centuries, the rise of capitalist farming. England is 'the most revolutionary country in the world' in the sense that nowhere else could the land be farmed so exclusively in the interests of money returns.

For reasons of space it has only been possible to expound Professor Lavrovsky's

views, not to attempt to criticize them. The exposition is necessarily very bald and summary, and can give no impression of the wealth of carefully handled statistics with which his conclusions are supported. This indeed, rather than any revolutionary novelty in the conclusions themselves, is the main value of this book. Professor Lavrovsky's generalizations, moreover, as he is careful to remind us, apply only to those parishes which he has studied, namely those enclosed by act of parliament between 1793 and 1815. It is to be hoped that this valuable work will find an early translator.

CHRISTOPHER HILL

ECONOMIC HISTORY OF AUSTRALIA

BRIAN FITZPATRICK. *The British Empire in Australia: an Economic History, 1834-1939*. (Melbourne University Press (Milford). 1941. pp. xxxii + 529. 21s.)

Mr Brian Fitzpatrick, whose able book on *British Imperialism and Australia, 1783-1833* appeared about two years ago, has completed in the work now before us a two-volume economic history of Australia which will undoubtedly be a standard work for many years to come. Though not challenging comparison with Shann in literary power, he corrects his predecessor on many points of fact, and his interpretation is so different that, whatever their own views, all students of the economic history of the British Empire should find room for both on their shelves. Mr Fitzpatrick's interpretation comes very near to a Marxian interpretation, though he eschews Marxist jargon and has a scholar's regard for facts. His command of the Australian sources and his handling of statistics are alike remarkable. All these characteristics help him to bring out in a new and telling way the importance of banking and private investment in British policy towards Australia and in the development of the Australian community. Here it is that he makes his most original contribution to the subject; but it seems to the reviewer that he presses his general argument too far. An economic interpretation of history has more validity in Australia than in many other countries; but Mr Fitzpatrick is hardly entitled, without study from first-hand sources in this country, to fit imperial policy into his pattern as he does. He states categorically on p. 119 that 'Whitehall's colonial policy, from first to last as far as Australia was concerned, was never an imperial policy in the sense of something dictated by a realization of responsibility as a custodian or trustee... It was a series of fits and starts prompted as a rule by immediate situations at home, and it was never modified in the interests of a colonial people except when colonial protest rose to fever heat.' How does this interpretation account for such a minute as Stephen's on the theme that 'to expedite the augmentation of wealth in New South Wales by introducing the black race there from India would, in my mind, be one of the most unreasonable preferences of the present to the future, which it would be possible to make'? How does it account for Earl Grey's decision, when Port Phillip pressed for separation from New South Wales, to grant all the Australian colonies representative, and if possible federal, institutions? Mr Fitzpatrick, in fact, greatly exaggerates capitalist influence on British imperial policy in the period of self-government. The squatting order in council of 1847 is, indeed, evidence that there was such influence; but its division of the country into settled, intermediate and unsettled districts, and the express statement of the Duke of Newcastle in a despatch of 29 November 1853 make it clear that it was not intended to give the squatters indefeasible control of their lands.

Mr Fitzpatrick is happier in his treatment of the goldfields period, bringing out well the importance of the accumulation of local capital for investment. But he overrates the importance of companies employing wage-earning miners in the later 'fifties and early 'sixties. There were many co-operative companies; and the deduction of holders of miners' rights from the number of miners is not a

safe guide to the number of wage-earners, since a miner's right was not compulsory except for a title valid against legal challenge, and many did not trouble to take them out. Moreover he hardly allows sufficiently for the roving disposition of those days. The digger was very ready to go to New South Wales, Queensland, or New Zealand in search of gold and many storekeepers and hangers on would follow him. This should surely affect the interpretation of Victorian protectionism. 'Somehow', says Mr Fitzpatrick on p. 183, 'capital and labour had to be retained in Victoria.' That was perhaps the argument of David Syme (whom Mr Fitzpatrick omits to mention). But why should it be so, if we once abandon the Victorian for the wider Australian or Australasian point of view? Moreover it would at least require more detailed analysis, industry by industry, than Mr Fitzpatrick gives to establish the point that Victoria, with available capital, labour and raw materials and a sizeable consuming community, needed protection in order to develop manufactures.

Mr Fitzpatrick's treatment of the period since 1860 as a whole, however, is stimulating and effective. His criticism of Métin, who about 1900 wrote of the transference of power from the pastoralists to the workers and perhaps to the farmers, is characteristic. 'The "dominant class" had long been not the pastoralists but rather the custodians of the vast capital, largely British, of the banks and rich agency and finance companies which directed the Australian economy from the 'eighties and would continue to direct it' (p. 397). His treatment of twentieth-century state enterprise and labour legislation is also in terms of a contest for economic power. The state has in his view been left 'to administer essential services, like railways, in the operation of which private enterprise could not see much profit'; but the profitable field of heavy industry has not only been reserved for private enterprise: the state through its tariffs has made it more profitable. Industrial arbitration, the central principle of labour legislation, has not necessarily been in the interest of the worker but has rather been a new battleground for rival social philosophies. The only criticism of this realistic treatment that suggests itself is Mr Fitzpatrick's assumption that 'private agencies' were invariably moved by self-interest (for example in the 'battle of the plans') rather than by expert knowledge and public spirit.

The weakest part of Mr Fitzpatrick's book is his half-hearted attempt to deal with New Zealand. Being less conversant with the New Zealand than with the Australian material he makes a number of minor errors. New Zealand was not regarded as a dependency of New South Wales continuously from 1787 to 1840 (p. 49); Captain Hobson had never been Resident (p. 52); there were 46 miles of railway track in New Zealand in 1870 (p. 222); the real development of the dairy industry came in the 'nineties and not by 'the application of private capital, largely British, through companies' (p. 227), but rather through co-operation, encouraged by the state; it was not from New Zealand but from the Argentine that a chilled meat trade developed (p. 240 n.); it was in the Society Islands, not in New Zealand, that the London Missionary Society operated and Thomas Scott planted sugar cane (p. 252); the list on p. 351 of Government measures to assist small settlers omits what was probably the most important, the Advances to Settlers Act, 1894. The fact is, however, that since the gold-fields period New Zealand has been more and more distinct from the Australian economy, though they have naturally reacted upon one another. Mr Fitzpatrick does not appear to have asked himself often enough what he meant by Australia; to what extent economic growth conformed to and to what extent it transcended the political framework of the different periods. By so doing he might have deepened his study at various points. But what he has given us is so clear and firm in outline and exposition, so powerful in its grasp and logic, that all his readers must feel its deficiencies to be far outweighed by its achievements.

Postera crescet laude.

W. P. MORRELL

SHORT REVIEWS AND NOTICES

B. S. URLANIS. *The Growth of Population in Europe. (An Experiment in Enumeration.)* (Gospolitsdat, Moscow. 1941 (Russian).) The book represents an ambitious, and on the whole successful, attempt to sketch out the population changes since the very dawn of world history, and thus indirectly to check the Malthusian and other theories of population. In the opening chapter the author summarizes the results of the better known researches into the population of the ancient world. He makes little attempt at adjudicating between conflicting views. His treatment of the population of the feudal order in Part II of the book brings together most, if not the whole, of the available evidence of the population changes in Germany, England and France. He does not appear to be terrified by the statistical problems of Domesday Book, but is sufficiently cautious and critical in his treatment of the Black Death. His figures for Italy are almost entirely based on Beloch's highly speculative figures. The most valuable and the most original part of this section is that in which the rates of marriage, death and birth are discussed. The author's task gets easier as he approaches the modern period, but the value of his summaries of the population problem in England in the eighteenth century or in Western Europe as a whole in the nineteenth will not be of very great value to specialists. Unlike some other Marxist writers, Mr Urlanis does not drag in the names of the fathers of his church so frequently as to make the book unreadable. Had it been available in translation, it could well have been recommended for use as a textbook on the history of population.

M. POSTAN

S. B. CHRIMES. *Sir John Fortescue: De Laudibus legum Anglie.* (Cambridge University Press, 1942. Price 25s.) English medieval scholarship will be indebted to Dr Chrimès for what looks like a definitive edition of Fortescue's famous treatise. The text has been edited with great knowledge and care, and the introduction reinforces the author's reputation for intimate knowledge of the constitutional and political background of Fortescue's writings. The text is followed by copious notes, supplementing, and sometimes elucidating, salient points in the text. They are obviously the fruit of a great deal of research and are mostly written with knowledge and circumspection. Probably the only exceptions are the notes to p. 36 (*Unde inhabitantes terre illius locupletes sunt*). Dr Chrimès has made the quotation a pretext for a disquisition on the economic and social conditions of the country, for which he is obviously none too well equipped. Like so many other writers, he has been trying to adjudicate in the old conflict between Denton and Rogers, but his conclusions 'that some sections of the peasantry underwent a period of depression' are not supported by any evidence. Generally speaking, Fortescue's account of English prosperity is irrelevant to the problem which agitated Rogers. Fortescue was comparing England's condition with that of France, while Rogers and the other controversialists were comparing England's condition in the fifteenth century with that of the fourteenth and the sixteenth. The value of the book, however, is little impaired by Dr Chrimès's digression which does not affect the value either of the text or of the introduction.

M. POSTAN

ROBERT SIDNEY SMITH. *The Spanish Guild Merchant: a History of the Consulado, 1250-1700.* (Duke University Press. 1940. \$2.50.) The title of this monograph invites comparison between the Spanish Consulado and the English Gild Merchant. Evidently there are parallels between the two, just as there are between each and the *Kaufmannsgilden* of Germany, merely because all these bodies arose in response to similar stimuli. In so far as it may be still necessary, even to-day,

to contest Doren's quaint dictum that the gild merchant was a specifically German institution, the above comparison may be worth drawing. A more illuminating analogy, however, is with the English Chartered Company, which, like the Consulado, reached maturity in the later Middle Age, and was composed in the main of wholesale merchants engaged in trade overseas. Not even in its earliest stages does the Consulado seem to have been concerned with local, retail trade; nor was there anything in Spain corresponding to the almost invariable rule that every corporate town should have its Gild Merchant. Indeed, Dr Smith's account is mainly based on the records of but six towns: Barcelona, Majorca (Palma), Bilbao, Burgos, Seville, and Cadiz. Of these, five are ports, and the sixth was a wool 'staple'. Not until the eighteenth century, when it was already past its prime, was the Consulado established in the majority of sizeable Spanish towns. Moreover, the Consulado combined the functions of a gild with those of a court of merchant law. The 'consuls' exercised jurisdiction in all matters concerning trade and shipping, and the Code elaborated by that of Valencia (whose records, alas, are lost) became the model for them all. Procedure was summary, informal, and essentially suited, at any rate at first, to mercantile needs. The 'gild court' served the merchant community in other ways. At Bilbao, for instance, it promoted and financed harbour improvements, licensed pilots, made regulations for the conduct of marine insurance and the employment of bills of exchange. Naturally enough, the Consulados were largely preoccupied with local interests and rivalries. The port of Bilbao and the wool 'staple' of Burgos wrangled endlessly over the wool trade with France and Flanders; Cadiz and Seville contended for the monopoly of the Indies trade. To a great extent these very rivalries were regional rather than national in their scope; thus the Catalans made no serious effort to secure a share of the Indies trade. Indeed it is notorious that the very strength of local institutions in Spain has hindered, perhaps fatally, the growth of national unity. It is not therefore surprising to find the Consulados lingering on into the nineteenth century, when the lack of a uniform commercial code and the endless conflicts of jurisdiction between them had long been a serious impediment to trade within Spain itself. The promulgation of the *Código de Comercio* of 1829, which put an end to the Consular courts, was a reform long overdue. Dr Smith's evidently thorough exploration of the sources has brought out many points which there is no space to discuss in a short review. He remarks in passing that the Portuguese were excluded from trade with the Spanish overseas possessions during the period when Spain and Portugal were united. So too, were Spaniards excluded from trade with Portuguese dominions. This was, after all to be expected; the situation is precisely analogous to the exclusion of the Scots from trade with the Plantations between 1603 and 1707. Exclusiveness went further than that. Just as the Seville Consulado endeavoured to exclude all non-members from the West Indian trade, so the Portuguese pamphleteer Luiz Mendes de Vasconcelos was vainly urging, in 1608, that the East Indian trade be opened to all Portuguese merchants. The parallel is so close as to suggest that an investigation of the Lisbon archives might be fruitful for Spanish, as well as Portuguese economic history. After all, from many points of view Portugal is the largest and most cohesive of the 'states' of the Peninsula.

RICHARD HAMMOND

CECIL ROTH. *A History of the Jews in England*. (Oxford University Press. 1941. 15s.) This is a good general history and will undoubtedly be the standard work on the subject for some time to come. But the suggestion made on the wrapper and in the Preface, that the standard history of the Jews in England comes at intervals of two centuries from members of Merton College is rather absurd. For it ignores the fact that Roth's work is inevitably a new edition of the excellent work with the same title by Mr A. M. Hyamson (presumably not a member of Merton College) published as recently as 1928. The weakest part of the book is the story of the Medieval Settlement. There is no attempt to get

away from the conventional 'the Church forbade usury and so...' phrase, which actually occurs several times. Moreover, though the Jewry of England was small so far as Jewish communities in the Middle Ages were concerned, I doubt if any other single Prince possessed so large or interesting a Jewish community, and this gives opportunities in England for a much profounder study of the position of these Royal Sponges than Roth makes use of. The material is there, but largely relegated to obscure footnotes. On the other hand, this book contains much new material of considerable value on Jewish settlement under the Tudors and on the different forces fighting for or against the foundation of the present Anglo-Jewish community in the seventeenth century. By stopping the story with the completion of political emancipation in the middle of the nineteenth century Roth omits the interesting period following the trebling of the community's size with immigrants from Russia, and the various social and economic problems of absorption which that movement created. The book leaves a considerable field open for both economic and social studies of every period of the Anglo-Jewish community, but it gives a useful political general framework within which those studies can be made.

JAMES PARKES

Journal of Occurrences in the Athabasca Department by George Simpson, 1820 and 1821, and Report. Edited by E. E. RICH. (Hudson's Bay Record Society. 1938.) *Colin Robertson's Correspondence Book, September 1817 to September 1822.* Edited by E. E. RICH and R. HARVEY FLEMING. (Hudson's Bay Record Society. 1939.) These two books are complementary, since they each throw light on the same period in the history of the fur trade. In 1821 that commerce was about to enter upon its golden age, and in the person of George Simpson a man had already appeared in the north who was destined to dominate it for many years to come. Those who were familiar with its history during the previous two decades, however, could have had no conception of the brilliant future which lay immediately ahead. For a century and a half there had been rivalry between the fur traders on the St Lawrence and those on Hudson's Bay. In those early days to the bitterness of trade opponents there was added the national hatred of French for English, but when the French regime came to an end the fur trade went on and the French part of it passed into the hands of the vigorous Scottish traders from Montreal. These men brought a new efficiency and a new ruthlessness into the business of collecting furs and so by the end of the century they had pushed their forts far up the Saskatchewan. Fur traders had followed Mackenzie in his explorations to the remote north while others were soon to follow the trail which he had blazed across the Rockies to the Pacific. David Thompson entered the service of the North-West Company and explored half a continent. In the meantime the English on Hudson's Bay were lethargic, uninspired and remote. They stayed in their forts on the shores of the Bay and waited for the Indians to come down with their furs; the trade itself was conducted in a very lofty manner, but still it brought a steady though not large return to the English investors. When, however, the North-Westerns began to divert the Indians to their forts the old, easy-going life on the Bay came to an end and indeed the Company's fortunes sank very low so that in 1809 it was resolved that 'No Dividend can be paid to the proprietors of this Company's Stock for the past year'. Among the members of the Committee were some who appear to have considered the possibility of developing timber and other branches of trade in preference to that in peltries. But fortunately, after some hesitation, those who advocated a more vigorous forward policy prevailed. Colin Robertson, a former Nor'-Wester, proposed his scheme of carrying the Hudson's Bay trade into the Athabasca country which the Montreal traders were then claiming as their own territory. Though his scheme was bold, and although there is no question about the energy which he put into the work, bad luck dogged his trail as soon as it reached the far west. Nevertheless, it was he who pointed the way which Simpson

was later to follow with such brilliant success. This new forward policy of the old Company became involved with the colonizing schemes of Lord Selkirk to whom the editors of *Robertson's Letters* appear to do less than justice. The North-Westerns were bitterly opposed to the establishment of a colony in the Red River district and to the opening up of the Athabasca trade by the Hudson's Bay Company. This opposition led to open hostilities and miniature battles were fought between the two rivals. In consequence commerce languished and both suffered. It turned out, however, that neither was strong enough to destroy the other and so, since trade was the main aim of both, it was decided to compromise. Thus, this long and ancient rivalry ended in amalgamation of the two interests, which in the long run meant the triumph of the Hudson's Bay Company which absorbed the most active of the North-Westerns. The personality of Colin Robertson produces a mixed impression in the reader's mind. He had many defects of character and was not suited by temperament for the dull, monotonous routine of the trading post, but he had the capacity to conceive far-reaching schemes of development though he was never able to bring these to fruition. His wide-ranging conception of the problem demands respect. Simpson, the hard-headed, efficient, cold-blooded, ambitious Scot, was a very different man. He was master of detail, a great organizer and the very man to appreciate the possibilities of Robertson's idea. It was typical of this emperor of the fur trade that he gave little credit and no thanks to the originator of the Athabasca policy. These two volumes cast much light on a very important episode in the history not only of the fur trade but of Canada and of the Empire, for without the work of Selkirk, Robertson and Simpson there might be no Western Canada as the term is understood to-day and, indeed, no Dominion of Canada.

C. M. MACINNES

HUGH M. RAUP and REYNOLD E. CARLSON. *The History of Land Use in the Harvard Forest*. (Harvard Forest Bulletin, No. 20, Petersham, Mass., 1941. 65 cents.) In 1909 Harvard University acquired about 2300 acres of land in the township of Petersham, Worcester County, Massachusetts, which now comprise the Harvard Forest. The Director of the Forest and his associates have produced a number of technical bulletins, of which that under review is the most recent. While the object of the writers was to reconstruct vegetational history, their methods and certain of their conclusions have a wider historical interest. Petersham was virgin land in 1733 when the original grants were made to a group of men subsequently termed the Proprietors. The *Proprietors' Record* is still extant at Petersham, and contains descriptions of the original grants and surveys of the parcels of land later distributed by lot. It can be supplemented by the Registry of Deeds for Worcester County which goes back to 1730. Using these two primary sources, further supplemented by Probate Records, genealogies and contemporary histories, it was possible to reconstruct the former property lines of the township, and by careful field-work to establish them actually on the ground. Details of land use were collected from scattered references in the documents, and the authors were able to map the areas which had never been ploughed up, but represented the original pre-colonial virgin forest. Petersham reached its peak of population and prosperity about 1850, but rapidly declined in the latter half of the century, with the result that much cultivated land reverted to forest. White pine, which has a light and easily transported seed, colonized the abandoned fields, and made possible the intensive timber exploitation of the period 1890-1910. The pine in its turn has been supplemented in the present century by hardwoods. An interesting incidental result of the research was to establish the soundness of the observations relating to forestry of a late eighteenth-century local topographer, Peter Whitney. It seems not unlikely that a proportion of the terriers and surveys available in very great numbers in various archives in this country could be similarly plotted on the ground and in the result would provide richer material than when studied merely as documents.

E. G. R. TAYLOR

HELENE SARA ZAHLER. *Eastern Working Men and National Land Policy, 1829-1862*. (Columbia University Press. 1941. 15s. 6d.) This book is more valuable for its incidental lights on some important problems of American political and economic history than for its main thesis. The relationship between the 'frontier' between the possibility of acquiring land from the national domain cheaply or freely and the wage level and the degree of organization of the urban proletariat in the eastern cities, is one of the most debated topics in modern American historiography. Dr Zahler is fully aware of the complexity of the problem and aware, too, of the special difficulties inherent in the study of the section of the main field of investigation which she has chosen for her own. The Homestead Act of 1862 did meet some of the demands of the 'National Reform' movement whose apostle was George Henry Evans. What was the causal relation, if there was any, between the unsuccessful radical agitator and the adoption by the Republican party of a land policy that would have seemed radical enough in 1840? To what degree did the agitation of the National Reformers represent a serious and continuing interest of the politically minded working man of the eastern cities? To neither question is it safe to give a categorical answer, and Dr Zahler is reasonably cautious in her claims for her hero and his movement. She admits that not all, indeed not many, workers shared Evans's enthusiasm for an agrarian policy. 'The proceedings of these conventions [1835] show that organized labor was less interested in the public lands than in education and banking' (p. 30). 'Labor might be indifferent—some workers might even be hostile—but its loosely organized public meetings could be taken over by determined and articulate men. Once this had been done, they could declare themselves labor's spokesmen. Were they to repeat the claim often enough, the working man himself might come to believe it' (p. 64). But would the politicians be so easily taken in? They used the National Reform movement, as far as they could, without running any risks or making any serious commitments. Did they do more?

It is not enough to show that cranks like Gerrit Smith or Albert Brisbane or Horace Greeley took an interest in the movement; it is necessary to show that practical politicians took the movement as seriously as politicians of a later generation took organized voting-blocks like the Ku Klux Klan or the Anti-Saloon League, or sectional votes like the Irish or German blocks. There is no real evidence here that they did. And Dr Zahler surely forces the evidence when she makes the careers in Wisconsin politics of Messrs Durkee, Dodge and Smith proof of the power of the movement? Each of these politicians had his own importance, apart from any movement. And the allusion to them on p. 94 is chronologically baffling. The bill to limit land holdings which nearly passed the Wisconsin legislature in 1851 is taken as the high-water mark of the influence of the movement. 'Nevertheless, National Reform influence in Wisconsin did not end with the failure of the measure.' Probably not. But the election of Dodge and Smith to the United States Senate does not prove this point, as they were elected in 1848 when Wisconsin was admitted to the Union.

Like many researchers, Dr Zahler overestimates the importance of her movement and its leaders. But despite this human weakness, she has written a very useful book. It brings out new aspects of sectional politics and new light is thrown on the radical movements of the thirties and forties. It is not surprising to see the old familiar figures supporting this, like all other forward-looking measures. One side-line that might well have proved worth more attention than it gets here is the relationship with the agrarian schemes of Feargus O'Connor and other Chartists. The enemies of the National Reformers who attacked their 'agrarian' proposals knew what they meant. And the word might well have had Babouvist overtones to the generation that saw the great attack on New York feudalism.

D. W. BROGAN

A. H. McLINTOCK. *The Establishment of Constitutional Government in Newfoundland 1783-1832*. (Longmans. 1941. 15s.) At first sight, Dr McIntock's book might appear to offer little of interest to the economic historian, whose concern with the subject is indicated rather by the subtitle 'A Study in Retarded Colonization'. To the mercantilists of the 'first' British Empire Newfoundland was, as William Knox said in 1793, 'a great ship, moored near the Banks during the fishing season for the convenience of the English fishermen'. This conception, translated into legal terms by an Act of 1699 (not 1698, as Dr McIntock has it) was supported in season and out of season by the vested interests of the west-country fishing ports and by the rigid authoritarianism of the naval governors appointed from 1764. In fact, however, Newfoundland was outgrowing these theories: by 1783 the resident population had reached 10,000. Dr McIntock's main task is to show how the fact of colonization gradually extorted recognition from the Government and Parliament of Great Britain, which had left the resident population so long without any system of government, any property rights, or any but the most ineffectual and yet oppressive judicial system. The colonists were favoured by the changing economic circumstances during the Revolutionary and Napoleonic Wars and by the decline of mercantilism after their conclusion. Considerations of revenue led in 1811 to a parliamentary enactment making it lawful for certain 'ship's rooms' in St John's to be 'granted, let and possessed as private property'. The difficulty of importing food in wartime led in 1813 to authorization of the leasing of small sections to industrious settlers, subject to quit-rents to the Crown. Diminished fishing fleets led to the growth of the 'shore fishery', and the early spring seal fishery gave residents a new outlet for their enterprise. After the wars only Government bounties (such as the French employed) could hope to revive the West Country fishery; and prevailing opinion had turned against such devices. The distress in the island, however, enforced a positive policy. More weight was allowed to the liberal opinions of Chief Justice Forbes than to the reactionary naval governors: the Fishery Act of 1699 was repealed in 1824; a Judicature Act was passed in the same year; and the grant of constitutional government followed in 1832. Dr McIntock's book is a valuable and scholarly addition to the Royal Empire Society's Imperial Studies Series, of which it forms No. 17. Its subject-matter should interest many besides those specially concerned with the history of Newfoundland; and is presented in a clear and attractive style.

W. P. MORRELL

SIR ARNOLD WILSON, M.P. and PROFESSOR HERMANN LEVY. *Workmen's Compensation*. Vol. II. *Need for Reform*. (Oxford University Press. 1941. 18s.) With this volume is concluded the study of Workmen's Compensation of which the first volume was reviewed in the *Economic History Review* for 1941. In that review it was suggested that the main outlines of the author's final proposals might already be discerned in their preliminary study of the social and political development of the present Workmen's Compensation system, and the present volume bears out the suggestion. Yet the very success with which the authors have achieved their aim, as stated in a foreword by Professor Hermann Levy, of being 'objective, complete and comprehensive'—and in particular the completeness and comprehensiveness—may for some readers blur the picture of an all-embracing system of public administration, guided by a Compensation Commissioner or Board and buttressed by compulsory insurance which the authors advocate. The very minuteness of their inquiries into every aspect of the compensation problem, which makes the volume invaluable as a piece of research—for the systems of many countries beside our own are also surveyed—and as a foundation for reform makes it difficult going for the reader who wants to see the shape of the wood first and count the trees later. But this is merely to say that the authors have produced neither a popular guide-book nor a piece of large-scale pamphleteering but a scientific study which can be accepted as final and authoritative. It is a sobering thought that 'the German system of Work-

men's Compensation and, that of most great industrial countries, turns upon the bodily welfare of the injured workman, his restoration to full health and working capacity. The British system conceives of his injury as an "accident" for which the employer, if his liability is legally established, must pay a certain sum in cash—the sole nexus between master and man' (p. 218). The simple fact is that our system of workmen's compensation is a museum piece, a relic of an age when the attitude of the state to the individual was entirely different from what it is now. As a result it is neither efficient nor even cheap. Meanwhile, reform is hampered by a legal framework and administrative machinery which was founded with a tender regard to vested interests and has remained unchanged in its broad features since 1897. Among the points which the authors single out for attention we may note the establishment of fracture clinics, greater attention to the problems of occupational disease, review of lump-sum payments and of the legal aspects of liability generally, appreciation of the importance of rehabilitation as primary objectives if the English system, which at present merely aims at preventing the injured workman from becoming a public charge, is to become one under which we could say to the workman: 'Our first job is to make you fit again, and make you fit we will if by any means we can, before we discuss compensation. Treatment for your injury which will restore you to the category of regular wage-earners will be followed by training in a new job and, finally, by placement in suitable employment' (Sir Arnold Wilson, *Debates H.C.* 19 Nov. 1937; quoted p. 199). The authors have shown the lines on which the system should be remade, and it should be an early task of government to put their recommendations into practice, not bury them in yet another commission. Of these there have already been enough. E. M. HUGH-JONES

SIR ARNOLD WILSON, M.P. and G. S. MACKAY. *Old Age Pensions: A Historical and Critical Study*. Oxford University Press. 1941. 16s.) This volume marks another stage in the survey carried out by Sir Arnold Wilson and his various collaborators into the means whereby the changes and chances of this mortal life can be met or mitigated for the working man. Industrial accidents and death have previously engaged his attention, and in this present volume he turns to the problem of loss of earning power due to old age. In this volume, as in the earlier, we note the firmness with which he insists on the simple but rarely remembered fact that the income of the individual worker during working life seldom does more than maintain him and his family (until they too are of working age), leaving little margin for current contingencies, such as ill-health, nor for the ultimate contingencies of old age and death. Hence, not only are schemes of voluntary insurance of very little value, but compulsory schemes require to be buttressed by funds drawn from the general resources of the community. Various implications of this situation are indicated (rather than fully discussed) in the forewords contributed by Sir George Schuster, M.P., and Mr W. B. Reddaway. The main content of the book is a detailed scrutiny of the history and development of Statutory Old Age Pensions in this country, with particular reference to the period which opens with German legislation dealing with sickness and accident, invalidity and old age. For the student of social administration it is a rich source of material and reflexion. What were the real causes behind Bismarck's social legislation and how far do similar causes influence our own? That "'the money power" of to-day, resides less in banks than in insurance offices' is a fact of political importance. Gladstone's institution of the Post Office Savings Bank was a blow at the former as his Government Annuities Bill at the latter. The one succeeded and its success has been underwritten by the blocking in this country of the establishing of Mutual Loan Societies on the Raiffeisen system, while the other failed, and the power of insurance companies still remains to be effectively challenged. In the development of old age pensions, as in other fields of social legislation, the opposition

of vested interests has used the arguments of independence and thrift to defend expensive systems for exploiting these virtues. Most significant of all is the change in attitude between the argument of 1919, that old age pensions are intended merely to raise the existing means of the claimant to a level of decent subsistence, and the admission in 1940 that pensions should provide a whole livelihood. That Royal Commissions have performed their not unusual service of obstruction, does not deter the authors from recommending the establishment of another one to review the field anew, for they claim and on the whole with justice, that no other procedure offers equal advantages of impartial consideration. But we may echo the hopes of the authors that their work may prove 'of assistance' to such a body—an excessively modest view of the value of so extremely detailed an examination of the whole field. It may be too much to say that this volume renders the Royal Commission superfluous; undoubtedly it should make their deliberations extremely short. 'Si monumentum requiris circumspecte'; no more studies will come from Sir Arnold Wilson's pen. But the memorial he would have most desired is action and reform, and it is due to his memory that we who remain should see that this comes to pass.

E. M. HUGH-JONES

EDMUND J. B. FOXCROFT. *Australian Native Policy*. (Melbourne University Press in association with the Oxford University Press. 1941. 10s.) This is not simply a short history of Australian native policy. Mr Foxcroft's object is rather to assess the effectiveness of this policy and, 'where failure was the outcome, to point out some of the lessons to be learnt.' The book arose out of an essay on native policy in Victoria and most attention is devoted to this state. There is good reason to do so since 'the experiments in the first fifteen years after Victoria's settlement represented the most intensive attempt made in nineteenth-century Australia to civilise the aborigines'. The story Mr Foxcroft has to tell is, generally speaking, one of failure, with the native population dying out rapidly, especially in those regions where it was most closely in contact with the white settler. Nevertheless it is clear that vigorous and well-intentioned efforts were made to adjust the native to new conditions. Although what Mr Foxcroft calls the 'settler attitude' towards the native was frequently a stumbling-block, there can be no doubt of the goodwill of the Colonial Office in the early days of the Victorian experiments or of many of the local officials and of the missionaries who laboured with zeal in a most unprofitable field. The undoubted failure of these efforts was due, in the author's opinion, to complete ignorance of the native's civilization, or rather to the lack of understanding of the fact that it was indeed a 'civilization'. He speaks more hopefully of the closing years of the nineteenth century when the advice of anthropologists was listened to if not always followed and 'indirect rule' began to replace the disastrous direct detribalizing administration of the past. Even so, he speaks with cautious optimism about the future. Mr Foxcroft might well have made a much larger book out of the mass of material which he sets out in a useful bibliography. Instead he has chosen to write a short but most effective study of a big and important subject.

J. E. TYLER

W. E. D. ALLEN. *The Ukraine: A History*. (Cambridge University Press. 1940. 21s.) [*The Economic History of the Ukraine*, pp. 345-90 with map.] The present struggle for the Ukraine and its temporary occupation have added enormously to the extraneous interest of this study and to the need for such a study. It is now essential to an understanding of Soviet Russia's war potential, to know what exactly are the economic issues centering round the Ukraine, its natural resources and limitations, economic development and its relative importance in the general Soviet economy. These, in fact, are the questions which very opportunely Mr Allen sets out to solve. The scope of his survey is admirable. The treatment of the material is far less admirable. The style is turgid and overlaid with a film of inaccuracies which shows how superficial

the study of much first class documentation has been. The analysis of the varying agricultural conditions in the Ukrainian regions of Galicia, Podolia and Kiev, contains information difficult to find summarized elsewhere, and is most useful. The statistics showing the relatively high density of population on the Ukrainian lands, west of the Dnieper, or 60-70 people per square kilometre, should discourage 'Western dreamers' seeking vacant lands in the Ukraine, as Mr Allen correctly points out. On the other hand, the heavy proportion of Russian sugar beet and sugar production in the Ukraine (now in German occupation) is no Hitlerite dream, but a reality.

The statistics of produce marketed by the kolkhozniki and individual farmers (p. 360) are extremely dubious, and it is not clear where Mr Allen could have found Soviet official data (and no other statistics exist), showing that the free market has doubled its transactions in four years. Another strange statement on the following page is that the influence of the Revolution and the Soviet regime has been 'baleful on forestry in southern Russia'. Probably what is meant here is not the Revolution in the social sense, but the industrial revolution which led to the development not only of industry but of farming. It also seems to me completely erroneous to ascribe the reduction of agricultural production in the Ukraine, and of the sown area in particular, to the development of industry and mining. Because in fact both were completely independent of each other and the intensification of coal mining for example in the Donbas, did not greatly interfere with the expansion of grain crops.

In the section dealing with the industrial history of the Ukraine, it is stated without explanation that Soviet official information concerning the iron-ore industry of Krivoy Rog is 'probably' more reliable than that concerning the Donbas, but in the opinion of the reviewer there is no obvious reason why this should be so. The statistics of the nationality of workers in the Ukraine, listed on p. 367, can only refer to the 1926 census, though this important fact is not mentioned, as no analysis of this kind has yet been published on the basis of the later 1939 census. It is therefore quite misleading to produce these figures as if they described the status quo. The statement that tractors and other agricultural machines can only be finished in the Ukraine, is also quite incorrect; in fact finished tractors have long been turned out both by the Kharkov and Rostov plants. In view of the great industrial use of peat in the U.S.S.R. it is curious to read in one of Mr Allen's references to increased output of peat, that 'only the percentage of moisture retained in the peat has risen' (p. 373). The remarks about the 90% 'shoddy' output of the Soviet metallurgical industry, based on a very doubtful Soviet press reference, are equally ridiculous (p. 377). The assumption of a political motive behind the unbalanced industrial development of the Ukraine, whereby the relatively small production of consumption goods makes it dependent on other areas is, I am sure, quite false. This thesis entirely ignores the traditional industrial development of the various regions of Russia, such as the Moscow and Ivanovo regions, with their long-established predominance in the textile industry. These inaccuracies, picked at random, are typical of the general tenor of the book. May I point out finally that before the war there was already a steady stream of emigration from the congested Soviet Ukraine, both to Siberia and the Far East, so that Mr Allen's suggestion that an additional '10 million poor peasants should not strain the resources of the Dnieper lands' (p. 369) is rather unfortunate. One last point, in the excellent bibliographical note to chapter VII, it is stated that the Birmingham Bureau on Russian Economic Conditions *terminated its activities in 1935*. As a living member of that body, I would like to say that it is still alive and published its last memorandum (no. 13) in May 1940.

VIOLET CONOLLY

H. G. WANKLYN. *The Eastern Marchlands of Europe*. (George Philip and Son. 1941. 12s. 6d.) Popular ignorance of the affairs of the smaller nationalities on the Continent was well illustrated by Neville Chamberlain's remark at the time of the Munich crisis that it was dreadful to be digging trenches because of a far-

away country and a quarrel of which we knew nothing. Miss Wanklyn's description of eight far-away countries on the borderlands of Central and Eastern Europe illuminates a field of study which has hitherto hardly received the attention which it deserves. These eight countries—Finland, Estonia, Latvia, Lithuania, Poland, Czechoslovakia, Hungary and Jugo-Slavia—stretched from the Arctic to the Adriatic. They lay in that border region between the Russian- and German-speaking peoples which has long been the scene of bitter rivalry between Slav and Teuton. They all gained—or recovered—their independence after the war of 1914–18, and preserved it through twenty troublous years. The author examines the permanent factors which have influenced the life and policy of these states—'geographical position and resources; historical tradition; religious and economic development'. She shows how often these small states have prized freedom above economic welfare. Students of economic history will be particularly interested in the description of the resources and economic policies of the border states. Miss Wanklyn has travelled widely among the peoples she describes. Scrupulous impartiality marks her treatment of highly controversial topics. The text, the notes and the excellent maps show how carefully she has examined the English and French literature on the subject. Little attention appears to have been paid to the labours of German scholars in this field of study.

W. O. HENDERSON

CLEONA LEWIS, *Nazi Europe and World Trade*. (The Brookings Institution' Washington D.C. and Faber and Faber. London. 1941. 10s.) In this book a careful examination is made of certain economic consequences of the unification of that part of Europe which was under German occupation (or within the German sphere of influence) in the middle of 1941. This included all Europe outside the British Isles, Russia and Turkey. The author describes the economic resources of the region and analyses its commercial relations with other parts of the world in 1929 and 1937. 'Conceiving this area as a single country, and regarding the trade between its component parts as external trade, we seek to determine what problems it faces with regard to external trade.' In these years the region imported food and raw materials and exported manufactured goods. The value of the imports exceeded that of the exports, and the difference was met partly by borrowing and partly by 'invisible exports', such as revenue from tourist trade, profits from shipping services and remittances from emigrants. If Germany were in a position after the war to try to weld the region into a self-supporting economic unit two major problems would have to be faced. First, Germany would still be without adequate supplies of important raw materials (e.g. cotton, rubber, tin and copper). Secondly, a decline in receipts from international services and borrowing might be expected, and this would increase the difficulty of paying for essential imports. Fortunately these speculations are somewhat premature. But students of economic history will welcome the impartial survey of certain aspects of pre-war international trade upon which these discussions of future possibilities are based.

W. O. HENDERSON

JOHN U. NEF. *The United States and Civilization*. (Chicago University Press. 1942. \$3.00.) Professor Nef's book embodies his Walgreen Foundation Lectures which he delivered in 1940–41. Their subject matter is a historical critique of American culture and civilization. Professor Nef believes that 'the United States can hope to defend civilization only by working toward other ends from those which have gained the ascendancy and guided the actions of Americans during the last fifty years'. These prevalent aims he analyses and castigates as the cult of purely material values, and consequent neglect of the Platonic values of beauty, truth and goodness. The book is a protest and a revolt against that tendency which led a prominent American psychologist to measure the 'goodness of life for good people' in such terms as the quantity per head of gas, electricity, telephones, wireless sets, motor cars, and the number of copies in

circulation of *Better Homes*, *Good Housekeeping*, and the *Literary Digest*. The author examines the effects of this materialistic set of values on art, religion, philosophy and education, and shows how in each sphere, it has meant a sapping of the very basis of civilization; a preference for quantity rather than quality, an accumulation of knowledge without the wisdom to use it. 'The art of living has been lost even in the material plane itself, for three of the chief stimulants to increased consumption have been changes in fashion, changes in construction materials, and the spread of advertising. 'The most important driving force behind industrial production has been the desire of men for material things that they could do without.' But Professor Nef is more than a platonic prophet of woe. He sees much hope in both the American tradition and the American future, and makes plentiful practical suggestions for leading public taste and intelligence back to ideals of the spirit. Two of the most interesting chapters of the book are the last two on the future of democratic government and of international justice, which he sees as closely interconnected. The book suffers somewhat from being printed lectures, but it is full of thoughtful and stimulating comment and honest social criticism, both of which have immediate topical usefulness.

DAVID THOMSON

WESLEY CLAIR MITCHELL. *Business Cycles and Their Causes*. A new edition of Mitchell's *Business Cycles*: Part III. (University of California Press, Berkeley and Los Angeles. 1941. 18s.) Professor Mitchell's famous quarto volume of 1913 has for twenty years been out of print and is exceedingly rare. The part which has now been made accessible in a convenient form, is the last of the original work, in which it was headed 'The Rhythm of Business Activity'. It contains that classic description of what came to be regarded as the 'typical' pre-war business cycle which has ever since directly or indirectly provided the basis for most theorizing on the subject. While one may regret Professor Mitchell's decision to reprint only this part, it is unquestionably the one which has the greatest permanent value. And one may hope that the earlier, predominantly statistical and historical parts will before too long be superseded by further volumes of the later work on the subject prepared by Professor Mitchell in the National Bureau of Economic Research.

F. A. HAYEK

LIST OF BOOKS AND ARTICLES ON THE ECONOMIC HISTORY OF GREAT BRITAIN AND IRELAND

Compiled by J. DE L. MANN

The place of publication is London and the date 1940 unless otherwise stated. Works marked with an asterisk are of wider scope but contain matter relating to Great Britain.

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BY N. S. B. GRAS

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